FOUNDRY TRADE JOURNAL

EST. 1902

WITH WHICH IS INCORPORATED THE IRON AND STEEL TRADES JOURNAL

VOL. 108
No. 2266

MAY 12, 1960

Registered at the G.P.O. as a Newspaper

Offices: John Adam House, John Adam St., London, W.C.2

Single Copy, 1 -. By Post 1 4. Annual Subscription, Home 52 -, Abroad 60 - (Prepaid)

DETROIT PUBLIC LIBRARY

MAY 31 1960

TECHNOLOGY

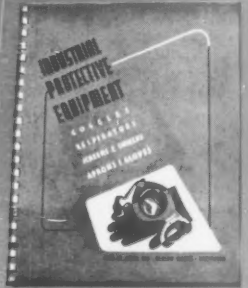
Thousands of man-hours lost

through industrial accidents—

—which adequate protective equipment could easily prevent

Protective Clothing and Equipment stocked by the T.W.W. Foundry Supplies Department includes: Goggles, Face Screens, Helmets and Shields, Respirators, Hoods, Aprons, Gloves, Mitts and Gauntlets, Asbestos Safety Clothing, etc.

Write for a copy of the Industrial Protective Equipment catalogue illustrated below.



THOS. W. WARD LTD

ALBION WORKS, SHEFFIELD

FS 31

THERE ARE STILL MORE ROTO-CLONES* IN SERVICE THAN ANY OTHER WET-TYPE DUST COLLECTOR

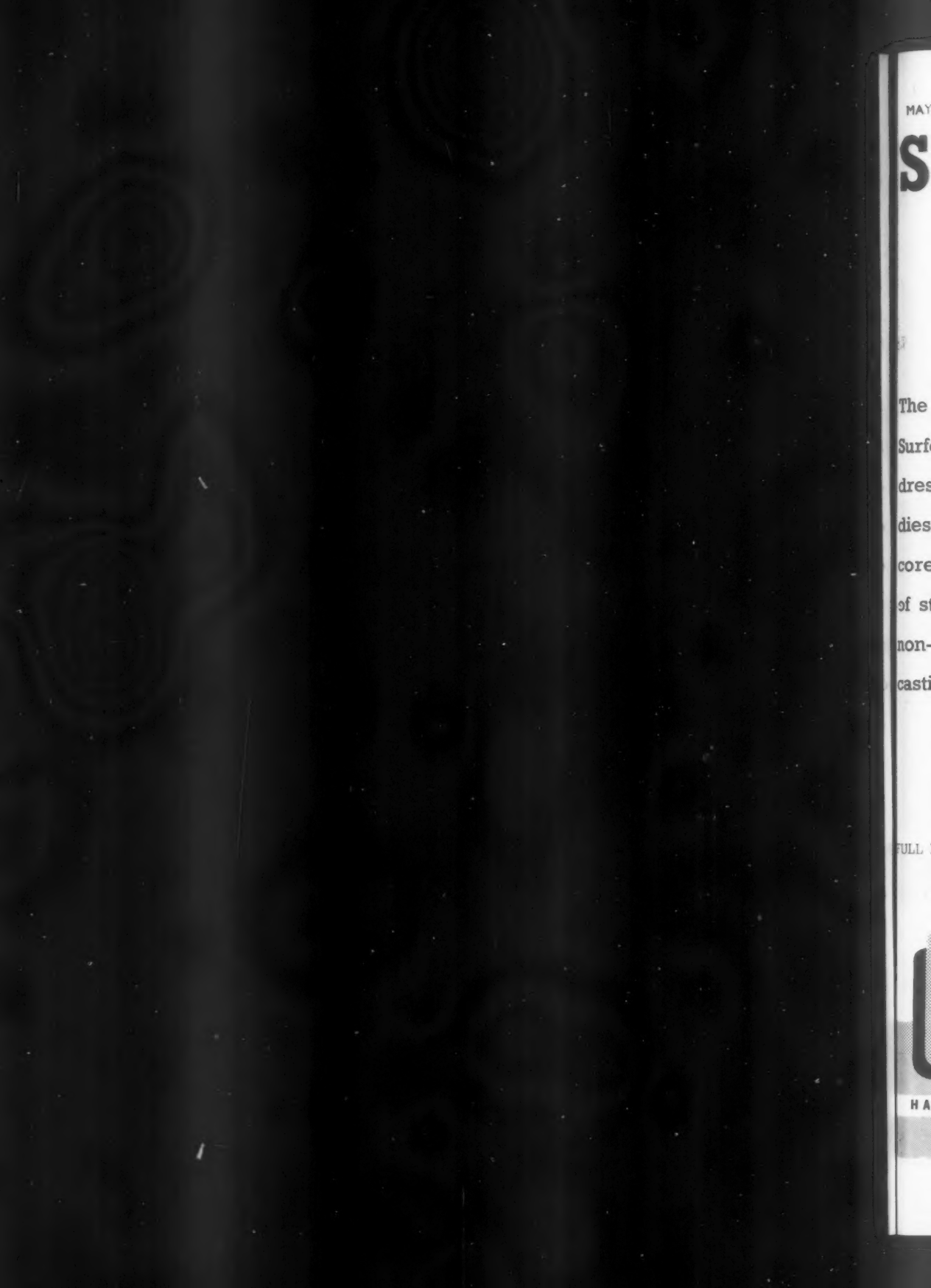
AIR CONTROL
INSTALLATIONS LIMITED

RUISLIP · MIDDLESEX · RUISLIP 4066

BIRMINGHAM · MANCHESTER · NEWCASTLE · GLASGOW

* *Registered Trade Mark. Made by Air Control Installations Ltd., under licence from American Air Filter Co. Inc.*

1960



SURFEX *for* DIES CORES *and* MOULDS DRESSINGS

The comprehensive Surfex range includes dressings for gravity dies, sand-mould and cores. For production of steel, iron and non-ferrous alloy castings.

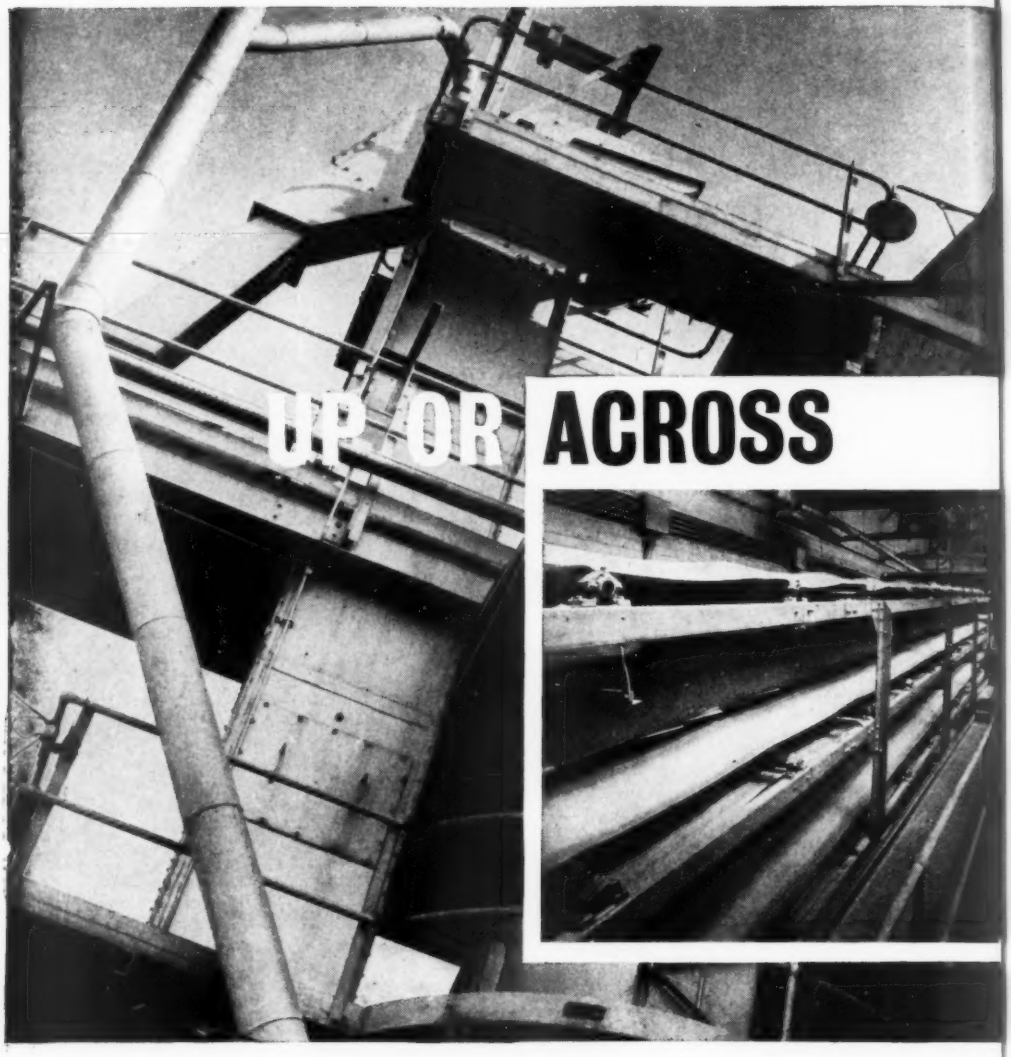
Surfex AL4 White Core paint being sprayed on a cylinder head jacket core.

FULL INFORMATION IN OUR NEW LEAFLET NO. 8.

HARMARK FOUNDRY SUPPLIES

Manufactured by

HARBOROUGH CONSTRUCTION CO·LTD·MARKET HARBOROUGH



Vertical bucket elevators showing the maintenance platform, and a three tier main cooling conveyor, designed and installed by STOTT'S *for* LEVER BROS. *Port Sunlight Ltd.*

Whatever your materials handling problem STOTT'S will provide the answer—like this installation designed for LEVER BROS. Port Sunlight Ltd. STOTT'S specialise in meeting individual needs in individual ways that save time, space and labour. STOTT Elevators and Conveyors are designed from experience and are craftsmen-built for a long life of trouble free service. STOTT'S Technical Representative will advise on the best plan to suit your production line.

consult
S. S. STOTT LTD
materials handling to meet every need

S. S. STOTT LTD · HASLINGDEN · LANCS · TEL: ROSSENDALE 666 · A member of the Alenco Group of Companies

for SKLENAR—the casting vote!

The Sklenar type 320/500 furnace melts 500 lb. of brass or bronze in 30 minutes; 220 lb. of aluminium in 15 minutes; or 300 lb. of grey iron in 50 minutes.

SKLENAR

furnaces for general duties in the foundry.

VERSATILITY...

SKLENAR furnaces melt light alloys, brasses, bronzes, and grey iron in sequence with no risk of contamination.

EFFICIENCY...

SKLENAR furnaces give quick melts (500 lb. brass in 35 minutes) with low metal losses (maximum under 2 per cent.). Finger-tip control of atmosphere for melting non-ferrous metals is standard.

ECONOMY...

SKLENAR oil or gas fired furnaces save fuel (0·008 gallon of fuel oil or 4 cubic feet of gas per lb. of metal are typical). No crucibles to renew—no spares to worry about.

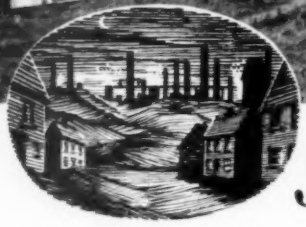
FULL TECHNICAL AND OPERATIONAL PARTICULARS AVAILABLE FROM

SKLENAR FURNACES LIMITED

BETTER MELTING WITHOUT CRUCIBLES

✻ *14 days' Free Trial in Great Britain*

385 NEWPORT ROAD · CARDIFF
TELEPHONE: CARDIFF 45645 (Private Exchange)
GRAMS: SKLENAR CARDIFF 45645



Staffordshire Landscapes

"To stand on Church Hill, Wednesbury at night and gaze around at the busy scene of myriad fires belching forth like so many volcanoes, was a sight not to be easily forgotten".

These words by a Staffordshire Historian describe Iron-smelting in the Black Country a hundred years ago.

Now, Church Hill commands a different view. There are too few furnaces today to turn the night sky glowing red; though combined output many times exceeds the awe-inspiring labours of a century ago.

The Black Country, where the early Iron-Masters wrought their successive legacies to Progress and darkened the sky, is turning green again. The scars of the old Iron-works have healed, a new power strides across the countryside from the distant generators and the smoke pall over the towns grows less and less.

Progress in Staffordshire, bringing almost every major improvement in the technique of iron-founding since 1700, is apparent in the landscape of the County as well as its products.

For almost a century and a half Pig Iron has been manufactured at Darlaston Iron Works. Today, the most modern methods of metallurgical control of raw materials and the finished product, enables them to supply Pig Iron of consistent uniformity to the most exacting specification.

Bradley & Foster
LIMITED

FOR QUALITY CONTROLLED
REFINED PIG IRON

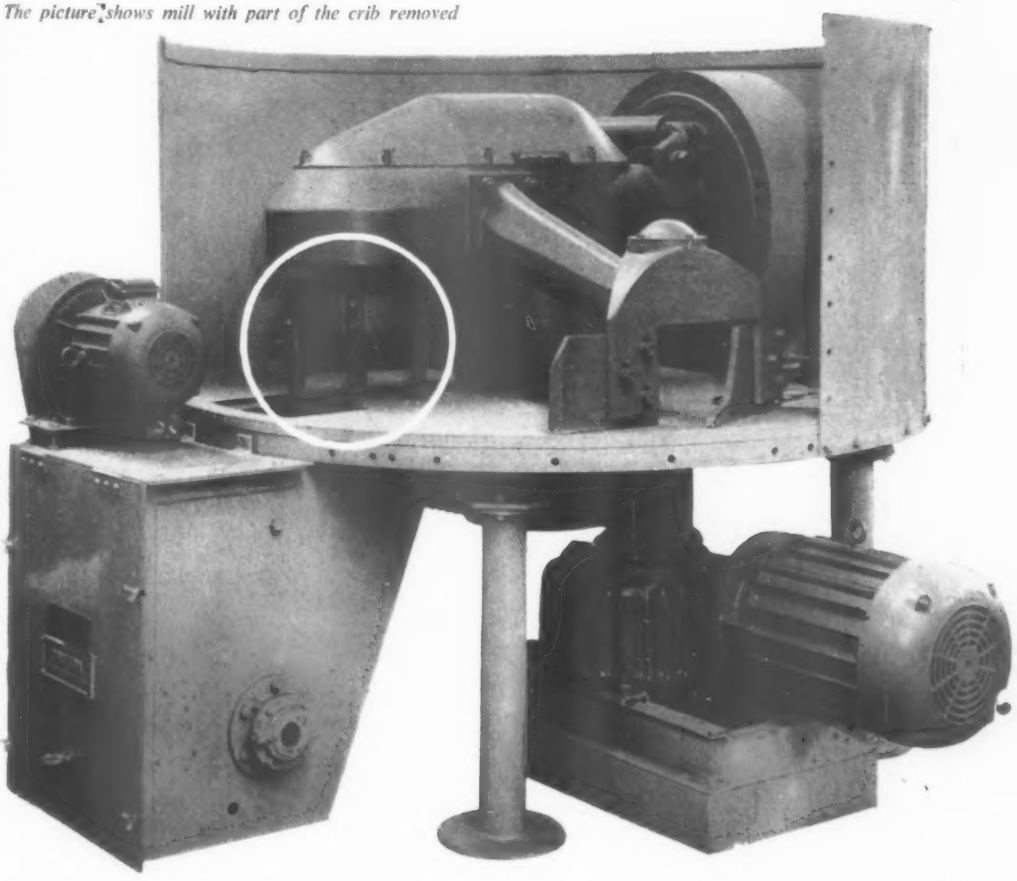
DARLASTON · STAFFORDSHIRE

L.G.B.

A member of the Staveley Coal & Iron Co., Ltd., Group.

This is our new 6 ft. mixing mill with the positively driven stirrers. A similar design will be available shortly in 4 ft. 6 in. dia. pan size.

The picture shows mill with part of the crib removed



Built in England by

PNEULEC LIMITED, SMETHWICK, Nr. BIRMINGHAM

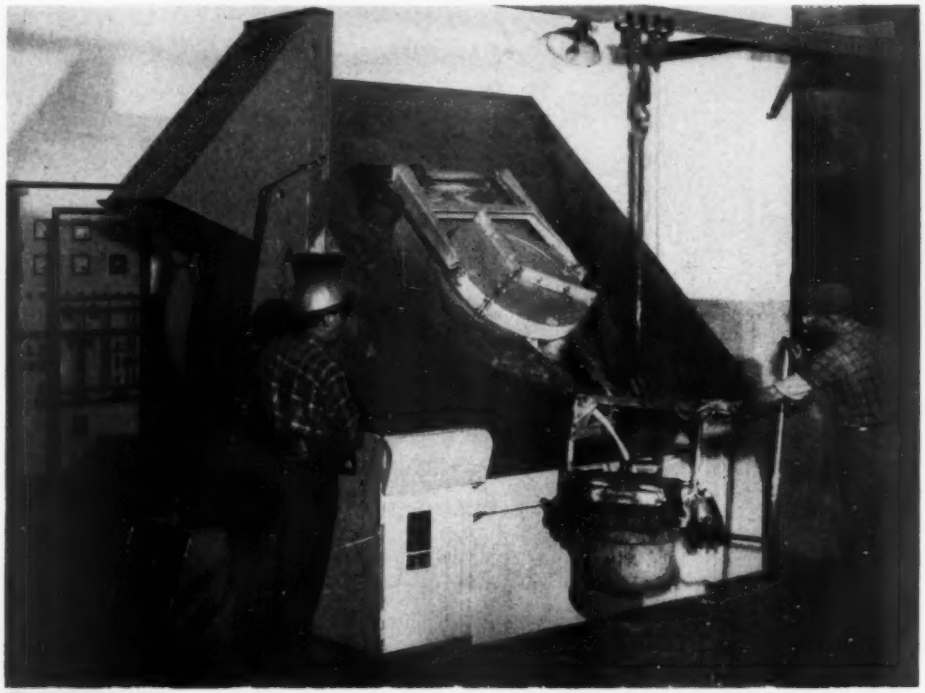
A new addition to the **Roper** **RANGE OF PRODUCTS**

by arrangement with **G. CRESCENZI** Turin, Italy,
the well-known specialist manufacturer of

MAINS FREQUENCY ELECTRIC INDUCTION FURNACES

OF THE CORED "ABI" & CORELESS "CSA" TYPES

for the production of special irons and steel, reclamation of C.I. borings and recarbonisation of steel scrap.



Roper Crescenzi

● Illustration shows Coreless Furnace, Reference "CSA" of 1½ tons capacity, with a rating of 300 KVA. With these Furnaces metal temperatures up to 1600°C. can be obtained, and continuous or intermittent operation is permissible.

E. A. ROPER & CO. LTD., KEIGHLEY, YORKSHIRE

Telephone: Keighley 4215/6. *Telegrams:* "Climax", Keighley.

J.J.M.

long working life

One of the ATLAS refractory lined soaking pits at the River Don Works of English Steel Corporation Ltd., Sheffield.

the essential quality of a refractory—
the ability to resist spalling and slag attack and the capacity to carry the load at high temperatures and to go on doing so for a long time.
That is the measure of ATLAS firebricks.
When next considering refractories remember that ATLAS has been 'carrying the load' for a very long time.

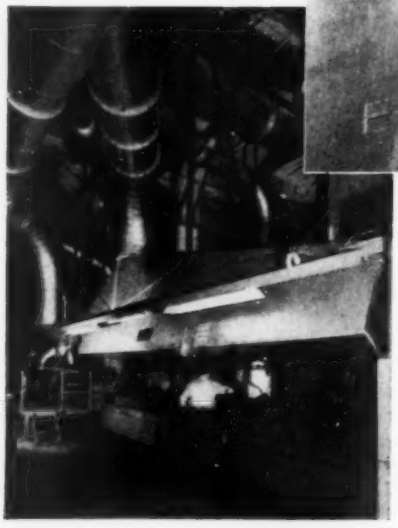
ATLAS Firebricks (37/39% Alumina)
ATLAS + A Firebricks (42/43% Alumina)
ATLAS and **SARCO** Refractory Cements
ETNA Firebricks (32/34% Alumina) for ordinary duty

UNITED FIRECLAY PRODUCTS LTD
BATHVILLE · ARMADALE · WEST LOTHIAN
REGISTERED OFFICE · 140 West George Street · Glasgow C.2
Telephone ARMADALE 313-316 Telegrams: "Combined" Armadale
A MEMBER OF THE WOODALL-DUCKHAM GROUP OF COMPANIES

HOLMES—SCHNEIBLE

system for dust collection and control

Exhaust hoods at the clamps off and castings removal stations. Photographs reproduced by permission of the Ford Motor Co. Ltd.



The Holmes-Schneible System installed at the new Thames Foundry of the Ford Motor Co. Ltd., removes more than half a million cubic feet of dust and fume laden air per minute, thus ensuring optimum working conditions twenty-four hours per day In addition over 200,000 cubic feet of clean air per minute are supplied at certain points as 'compensating air' to maintain the foundry heating balance

W. C. HOLMES & CO. LTD.

GAS CLEANING DIVISION,
TURNBRIDGE, HUDDERSFIELD,
London & Birmingham

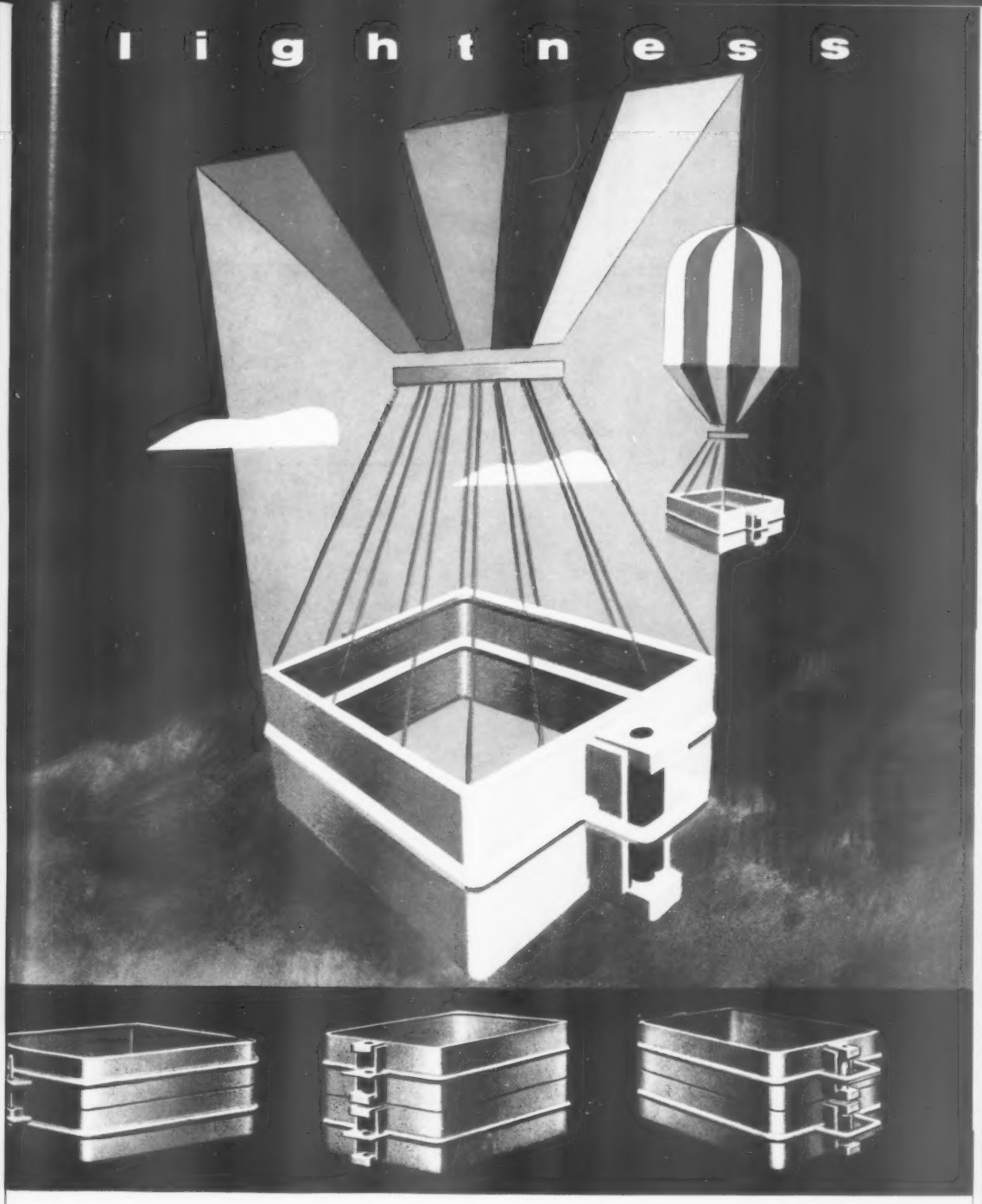
TECHNICAL ASSOCIATES - Australia - Woodall Duckham (Australasia) Pty Ltd. Switzerland - Elex AG. Germany - Apparatebau Rothemuhle Union of South Africa - Brandt Engineering (Pty.) Ltd. Sweden - Industrikemiska Aktiebolaget U.S.A. Koppers Company Inc.

For full details please write for a copy of Publication No. 54/23

C 9001

1960

l i g h t n e s s



olled steel sections of special design and
etal of special composition are but two factors
hich ensure lightness with great strength and durability.

Sterling

STERLING FOUNDRY SPECIALTIES LTD., BEDFORD, ENGLAND

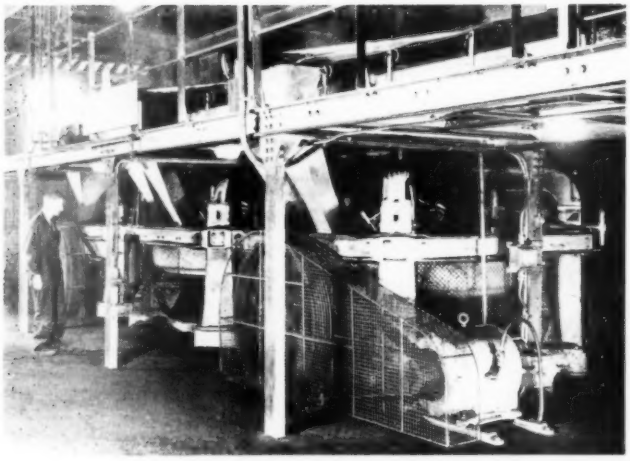
Cogent

For Increased Productivity!--

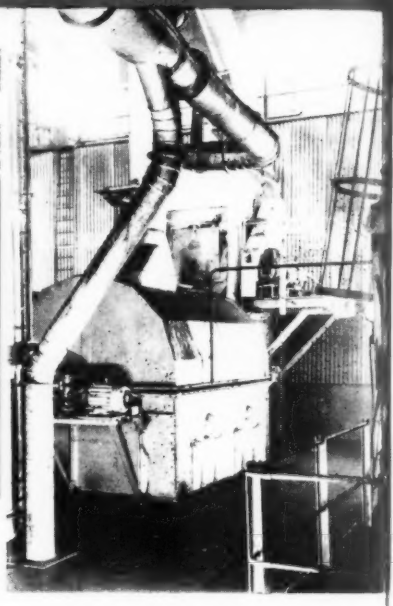
LEY'S MALLEABLE CASTINGS COMPANY LIMITED

SPECIFY FE PLANT

FOR THEIR NEW DERBY FOUNDRY



THREE S.B.3 SAND MILLS PROVIDE A CONTINUOUS SUPPLY OF HIGH BOND STRENGTH MOULDING SAND (MAX. CAP. 30 T.P.H. EACH)



8' 0" 60" ROTARY SCREEN ENSURES "CLEAN SAND" FOR MILLS

OVERSEAS COMPANIES

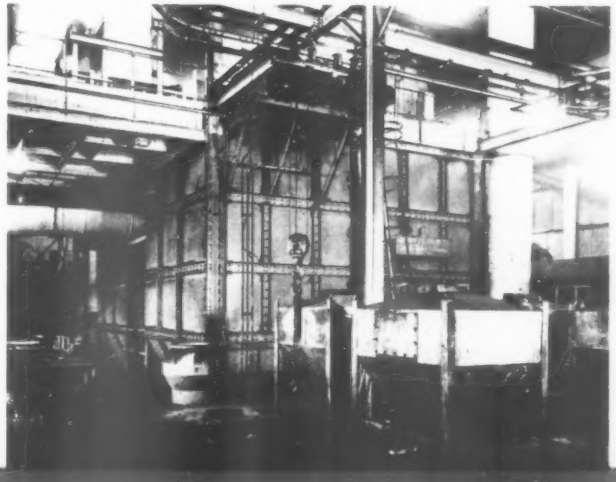
FOUNDRY EQUIPMENT (AUSTRALIA) PTY. LTD., Elizabeth, S. Australia

F. E. (NORTH AMERICA) LTD., Toronto, Canada

F. E. (SOUTH AFRICA) (PTY.) LTD. Johannesburg, S. Africa

"FOUNDRY EQUIPMENT" COMERCIAL ESPAÑOLA, S.A. Madrid, Spain

GENERAL VIEW OF SAND HANDLING AND DISTRIBUTION SYSTEM SHOWING TWIN OVERHEAD CONVEYORS FITTED WITH AUTOMATIC AND ELECTRONIC PLOUGH SYSTEM—ELIMINATING *"THE MAN OVERHEAD"*.



VIEW OF PART OF TWIN 125 TON CAPACITY SAND STORAGE HOPPERS EACH FITTED WITH FOUR 36" WIDE 13 3" CENTRES FEEDER BELTS FOR CONTROLLED SAND FEED TO MILLS

FOUNDRY EQUIPMENT LTD.
LEIGHTON BUZZARD, BEDFORDSHIRE, ENGLAND.

FE
FOR FOUNDRY EFFICIENCY

TELEPHONE: LEIGHTON BUZZARD 2441 (3 LINES)
TELEGRAMS: "EQUIPMENT" LEIGHTON BUZZARD

FOCUS ON 'FULBOND'

No 2 Bond Development

FULBOND combines rapid bond development and high initial strength enabling moulding sands to be prepared quickly and economically. In addition, the use of FULBOND gives the technical advantages of increased flexibility, wider control and a much more resilient sand.

Where Milling Time Can Be Varied

When a sand mix is milled the strength increases rapidly at first then more gradually until finally no further increase in strength will be obtained. Additions of FULBOND will ensure that optimum bond strength is developed in the shortest possible time. This will eliminate any undeveloped clay in the sand avoiding the bad effects of excess clay and also increasing the output of milled sand to the maximum possible.

Where Milling Time Is Fixed

In mechanised foundries using continuous mills or where, due to the demand for sand, milling time is limited, only a fixed short time can be given. Undeveloped clay will therefore be present, this being wasteful and requiring extra moisture which reduces permeability. FULBOND will keep the content of undeveloped clay to a minimum.

Advantages can also be obtained by using FULBOND in unmilled sands prepared on the foundry floor.

For a copy of this Brochure please write to:

THE FULLERS' EARTH UNION LIMITED

Patteson Court, Nutfield Road, Redhill, Surrey

A member of The Laporte Group

CMF57

KAYE ALLOY CASTINGS LIMITED

HANDSWORTH, BIRMINGHAM

obtain high speed production, greater accuracy and cleanliness using Shell Cores in a wide variety of die castings.

Shell Cores ready for assembly in the die.

SHELL CORES...

. . Weigh a fraction of "solid cores" and are extremely low in raw material cost.

. . . Are ready for immediate use when removed from core box or can be stored indefinitely.

. . . Give all-over die cast finish and minimise hot tearing.

. . . Excellent permeability assists in the elimination of blowing.

. . . Reduce handling and labour costs and increase production.

. . . Improved coring arrangements show appreciable reductions in casting weights.

Any information you may require concerning the world-famous range of precision built Polygram Shell Moulding machines and equipment as supplied to principal Foundries in Britain and the Commonwealth, the Ministry of Supply, and the Crown Agents for Oversea Governments and Administrations, will be forwarded on request.

POLYGRAM SHELL CORE MAKING IS A *"MUST"* FOR THE LIGHT ALLOY FOUNDRYMAN

Polygram Casting Company have a competent and complete service to offer, and your enquires are invited.

Polygram

THE FIRST NAME IN SHELL MOULDING

POLYGRAM CASTING COMPANY LTD., SHERNFOLD PARK, FRANT, TUNBRIDGE WELLS, KENT. Telephone: Frant 346 (5 lines)

NEWSTAD *(Patented)*

Gas fired Portable Mould Dryers

Incorporate full protection against gas or electric supply failure

Air valve cuts off gas supply in case of electric supply failure.

Thermal output: 360,000 B.T.U's per hour or 500 cubic feet of hot air per minute at 400°. C Temperature range: 150° to 500° C.

Gas valve cuts off gas supply in case of pressure failure.

The ideal unit for drying moulds in situ.

Equally efficient for mechanised skin drying or moulds.

Safe - efficient - clean - reliable

Rapid penetration of the sand gives quick drying and perfectly clean moulds.

Supplied only by the Foundry Drying Equipment Specialists.

MODERN FURNACES and STOVES LIMITED

Builders of INDUSTRIAL FURNACES

BOOTH STREET, BIRMINGHAM 21. phone: SMEthwick 1591-2 grams: Mofustolim, B'ham 21

Drew Brown Limited
5410 Ferrier Street,
Montreal, 9. Canada.

COMMONWEALTH AGENTS

Forest Engineering (PTY.) Ltd.,
P.O. Box 6738,
Johannesburg, South Africa.

8/219

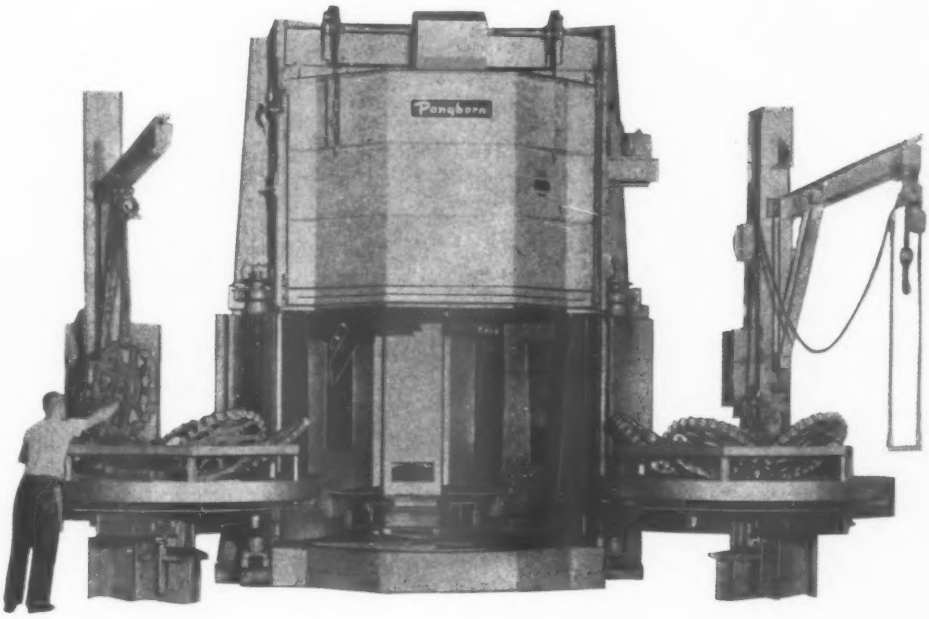


illustration of 8′ 0″ diameter
TWIN TABLE

MAXIMUM WORK

Machine	Dia.		Height		Weight
4 LM	4′ 0″	×	2′ 0″	×	2,000
6 LM	6′ 0″	×	3′ 0″	×	4,000
8 LM	8′ 0″	×	3′ 6″	×	10,000
8 LM-1	8′ 0″	×	5′ 0″	×	12,000

"Panqborn"
AIRLESS
SHOT BLASTING
MACHINE

with guaranteed 10,000 lb.
loading capacity each table

HEPBURN CONVEYOR CO. LTD.
WAKEFIELD

SINCE 1947

ONE WALSALL FOUNDRY HAS PURCHASED 2,950 PAIRS OF 'TALBARD' MOULDING BOXES.
A LARGE NUMBER OF THESE BOXES WERE MADE WITH ONLY ·003" PIN CLEARANCE.
OUR CUSTOMERS ASSURE US OF THEIR COMPLETE SATISFACTION—

WHY?

E. TALLIS & SONS LTD
MANUFACTURERS OF "TALBARD" MOULDING BOXES
TALBARD WORKS
CHARLES HENRY STREET
BIRMINGHAM · 12
PHONE MIDLAND 4387

ASK FOR LEAFLET No. 215N

balanced approach to ventilation

Roof ventilating shutters

In planning ventilation, many factors demand study. Outlet area, airflow, velocity, overall volume, air temperature, seasonal fluctuations. All these must be brought into balanced relationship before the type, location and number of ventilators is finalised. Hills are continuously assessing such factors, opening the way to better working conditions—*better production*—in foundries, rolling mills, factories. Let Hills Technical Department answer *your* ventilation problems.

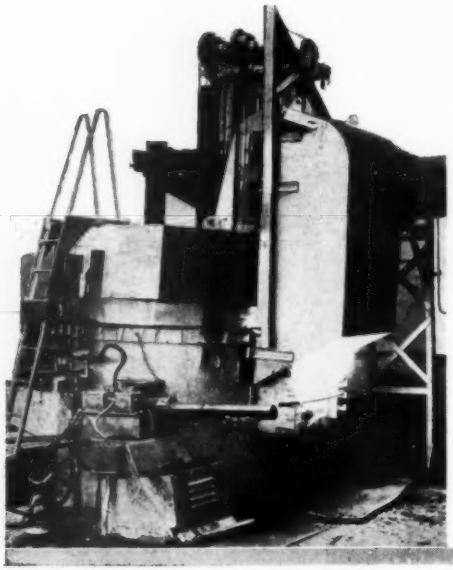
HILLS (WEST BROMWICH) **LIMITED**

ALBION ROAD, WEST BROMWICH, STAFFS.
Telephone: West Bromwich 1811 (15 lines)

London: Chapone Place, Dean Street, W.1
Telephone: Gerrard 0526/9
Branches at: Manchester, Bristol, Newcastle-on-Tyne, Glasgow

V.7

TILGHMAN'S DUST COLLECTORS



SERVING THE FOUNDRY INDUSTRY

a complete installation at Arthur Balfour & Co., Ltd. Sheffield

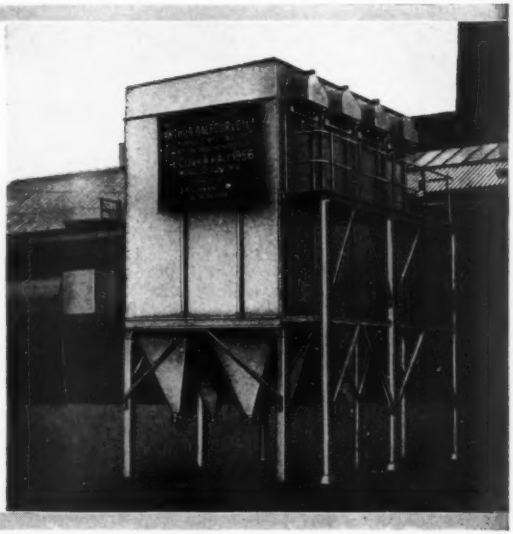
ELECTRIC FURNACE HOODS

Tilghman's specialise in the design, manufacture and supply of equipment for extracting fumes emitted from electric arc furnaces, either by fitting an exhaust hood, as illustrated, or alternatively by direct extraction from the furnace body.

TUBULAR FABRIC COLLECTORS

Automatic bag filter plants with synthetic filter tubes ensure *no visible discharge to the atmosphere even during oxygen lancing.*

The plant illustrated has now been operating over eighteen months without any tube replacement.



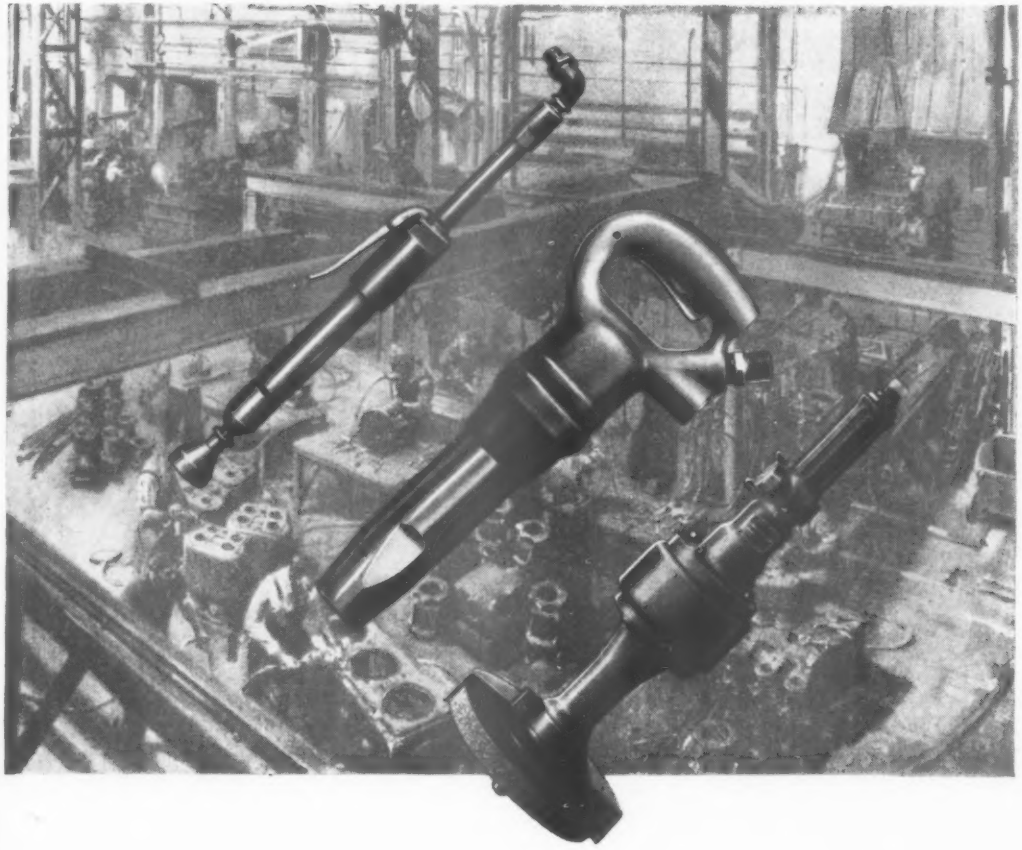
TILGHMAN'S LIMITED

Tilghman's Limited

BROADHEATH, ALTRINCHAM, CHESHIRE

LONDON OFFICE: 1 CHESTER ST., S.W.1.

A MEMBER OF THE STAVELEY COAL AND IRON CO., LTD. GROUP



Quality Production

In this age of mass production the role of the foundry is more important than ever. Quantity without loss of quality is essential in the face of today's keen competition. "BROOMWADE" Pneumatic Tools are at work in foundries the world over, speeding the production of those accurate castings so necessary to the manufacturer.

Illustrated are (left to right) the BR3 Rammer, DX5 Chipping Hammer and the GR3 Grinder. For full details write for Publication No. 407 T.E.

"BROOMWADE"

AIR COMPRESSORS & PNEUMATIC TOOLS
YOUR BEST INVESTMENT

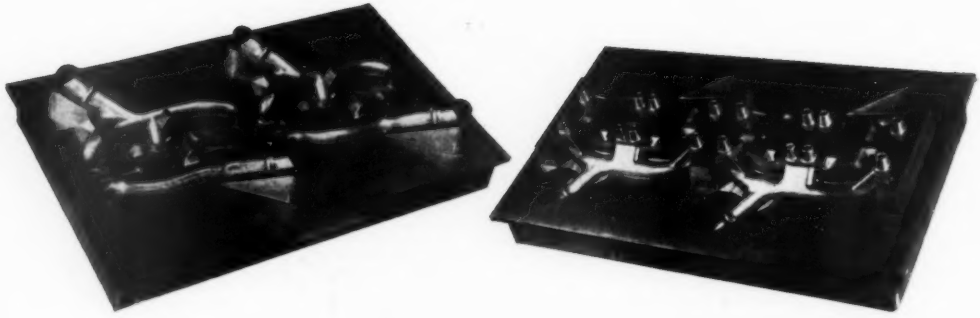
BROOM & WADE LTD., P.O. BOX No. 7, HIGH WYCOMBE, ENGLAND

Telephone : High Wycombe 1630 (10 lines) *Telegrams : "Broom", High Wycombe (Telex)*

673SAS

UNBEATABLE!

PRESSURE *by* CAST



CROCKETT LOWE LIMITED

THE LATEST METHODS FOR THE FINEST PATTERNS *of course!*

Designers and Manufacturers of Pattern Equipment by Craftsmen who know every phase of Pattern Making and have practised it to its Finest Skill. Our DRAWING OFFICE FACILITIES, TECHNICAL CONSULTANT SERVICE, and above all SPECIALISED MACHINERY and MODERN EQUIPMENT assure maximum economy in every step of the procedure.

This is why leading manufacturers rely on us for the utmost accuracy, economy and production technique in Wood and Metal Pattern Equipment engineered to fit the needs of your foundry.

Expert Pattern Moulders in our own Foundry produce :—PRESSURE CAST COPE-and DRAG PLATES, **SINGLE** AND DOUBLE SIDED MATCH PLATES in ALUMINIUM & BRONZE, SHELL MOULDED PATTERN EQUIPMENT. EPOXY RESIN AND ALL TYPES OF WOOD AND METAL PATTERN EQUIPMENT for the Engineering, Automobile, Aircraft, Electrical, Marine, Shipbuilding and Allied Trades.

PATTERN MAKERS TO BRITISH INDUSTRY

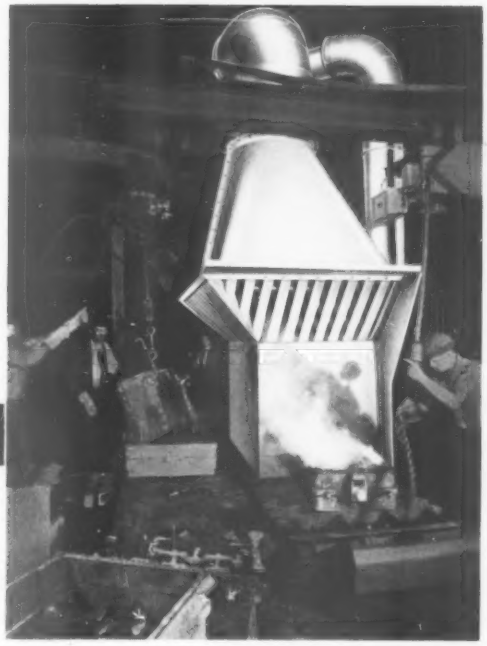
NUCLEAR HOUSE, SUMMER HILL STREET, BIRMINGHAM 1

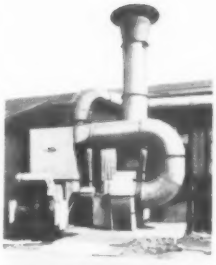
Phone : CENtral 5371-2 GRAMS : NUCLEAR, B'HAM.

FOUNDRY

DUST

and fume removal





Spenstead Wet Type Arrester

If dust is YOUR problem pass it on to us. We will settle the matter with SPENSTEAD EQUIPMENT.

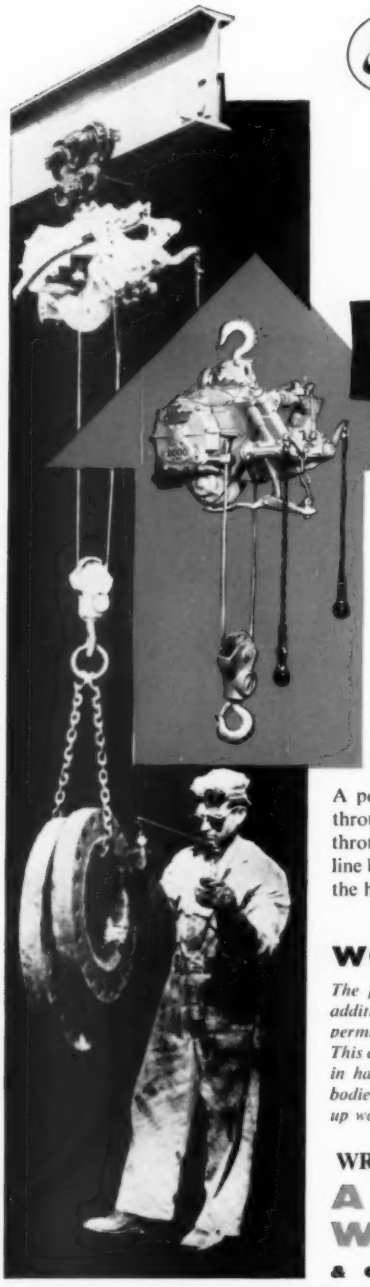
WE EXTRACT THE **DUST** FROM IN**DUST**RY

SPENSTEAD

SPENCER & HALSTEAD LTD.,

BRIDGE WORKS, OSSETT, Yorkshire. Tel: 821-4. Grams. "Spenstead Ossett"

Powney S6



Thor

ARMSTRONG WHITWORTH

Safety

AIR MOTOR-DRIVEN

HOISTS

Armstrong Whitworth Air Motor-Driven Hoists provide a SAFE and RELIABLE solution to your Materials handling problems. The Motor is rigidly secured to the heavy steel cast Central Frame which takes the entire load strain. Starting, stopping, reversing and speed regulating are controlled by the Control Chains. The hoist operates smoothly, and without the usual jerk found in throttle operated air hoists.

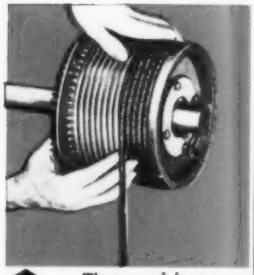
POSITIVE AIR BRAKE

A positive air brake which releases when the throttle opens is automatically applied as the throttle closes. The load cannot fall if the air line breaks or the compressor shuts down while the hoist is in operation.

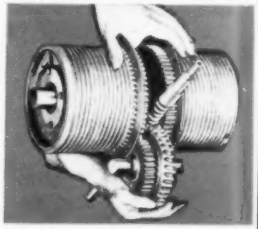
EQUIPPED WITH WORM GEAR DRIVE

The positive worm, driving in both directions, in addition to the shifting eccentric used in the motor, permits the location of the load in any exact position. This ability to locate the load is absolutely necessary in handling foundry flasks, setting up automobile bodies in position on the assembly track, or setting up work for machine operations.

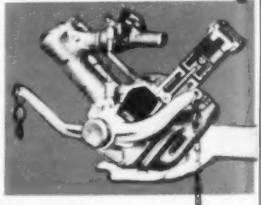
RS7



The grooved drum assures no climbing. No slipping. No jerking. No frayed and dangerous cable. The cable ends are widely separated when the cable is down, thus preventing the load from twisting and winding up.



The motor: Famous Armstrong Whitworth Close-Quarter type Motor with non-leakable seat throttle. Double-acting pistons cushioned at both ends of stroke to further reduce vibration.



WRITE TODAY FOR LITERATURE

ARMSTRONG WHITWORTH

& CO (PNEUMATIC TOOLS) LTD

MAIN SALES OFFICE: 34 VICTORIA ST · WESTMINSTER · LONDON · SW1
Cable Address: ARMWHITOOL Sowest London · Tel: ABBey 3817

SHEFFIELD OFFICE: 51 HARVEST LANE · SHEFFIELD 3
Tel: Sheffield 24775 · Grams and Cables: ARMWHITOOL Sheffield

CONTINENTAL BRANCH: THOR TOOL CONTINENTAL INC · JORDAENSKAAI 25 · ANTWERP · BELGIUM
Tel: 32.27.84 · Cables: THORTOOL Antwerp

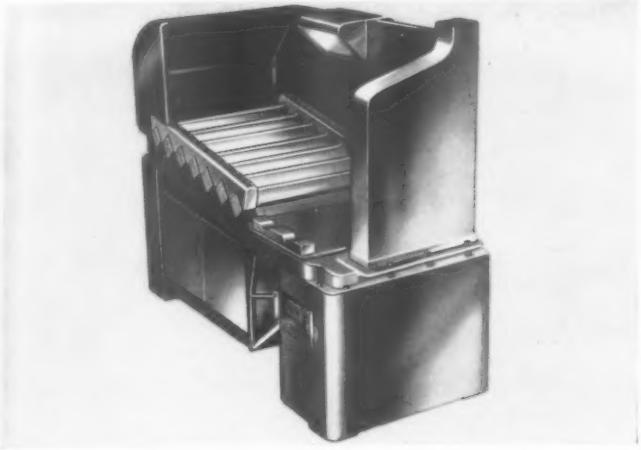
GLASGOW OFFICE: 21 BALIOL ST · GLASGOW C3
Grams and Cables: ARMWHITOOL Glasgow C3

BIRMINGHAM OFFICE: 19 CHURCH LANE · BIRMINGHAM 20
Tel: Northern 5354 · Grams and Cables: ARMWHITOOL Birm

FACTORY: TYNEMOUTH · ENGLAND
Telephone: North Shields 3111 · Grams and Cables: ARMWHITOOL Tynemouth

P1326

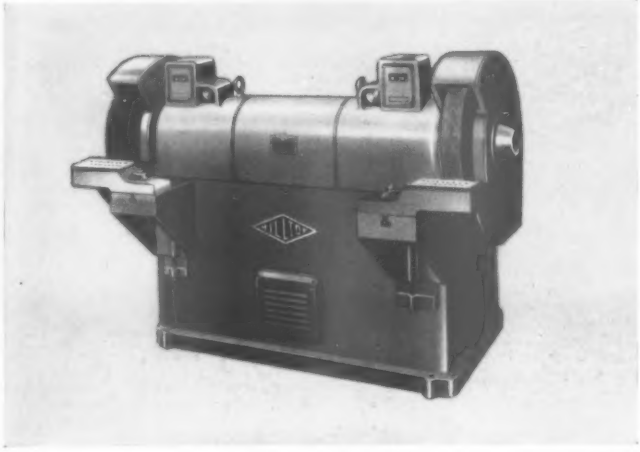
As installed in the Foundries at Durgapur—



the great
£100 million
Iron & Steel works
erected in India
by British enterprise

"K & L" FETTLING BENCH

For dust-free fettling with reduced noise.



"HILLTOP" HIGH SPEED GRINDER

With 3-speed, independent drive for each wheel, and dust control equipment.

by

MOLINEUX

Molineux Foundry Equipment Ltd.
London, N.19, England.

FOXBORO

Foundry Instrumentation

Weigh all the air

THE FOXBORO AIR WEIGHT CONTROL SYSTEM is specially developed to provide the Foundry Industry with Uniform Cupola Control. This completely Automatic System controls the weight of Air delivered to the Cupola, reduces fuel consumption and makes possible :—

UNIFORM HEATING
BETTER POURING
HIGHER QUALITY CASTINGS

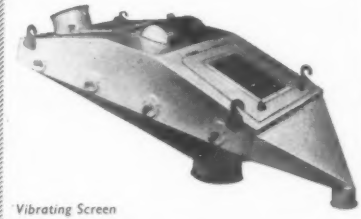
In addition, Foxboro Systems are available for measuring, recording or controlling — Pressure, Humidity, Dewpoint, Temperature and many other variables.

FOXBORO-YOXALL LIMITED

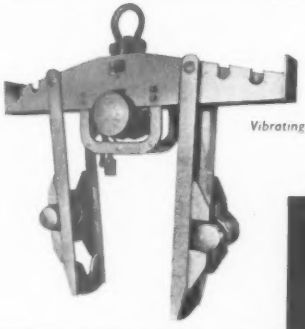
REDHILL • SURREY • ENGLAND

modern foundries need SINEX

The full range of foundry products made by Sinex Engineering Co. Ltd., acknowledged leaders in the field of industrial vibratory equipment, is now marketed exclusively by Foundry & Metallurgical Equipment Co. Ltd. For advice on Sinex Products consult FAME.



Vibrating Screen



Vibrating Crane Beam

vibratory equipment

VIBRATING SCREEN

Compared with the practice of screening with a separate power unit, driving belt, etc. the SINEX vibrating screen shows considerable economies in cost and power consumption.

VIBRATORY CONVEYOR

Ideally suited to foundry conditions. Having no roller bearings, rollers, jockeys or belts, it is essential under knock-out grids where hot sand and metal ruin rubber belts.

HIGH FREQUENCY KNOCKOUT GRID

Simple to install, it is made to withstand the arduous conditions of foundry service and will not damage the joint edges of moulding boxes.

'MINOR' MAGNETIC FEEDER

Used to dispense additives into streams of molten metal in the spout of a cupola, and for making controlled additions in continuous sand milling plants.

VIBRATING CRANE BEAM

A supplement to the ordinary crane beam making possible the emptying of moulding boxes without the use of large hammers and heavy bars.

High Frequency Knock-Out Grid

FAME

FOUNDRY & METALLURGICAL EQUIPMENT CO. LTD.

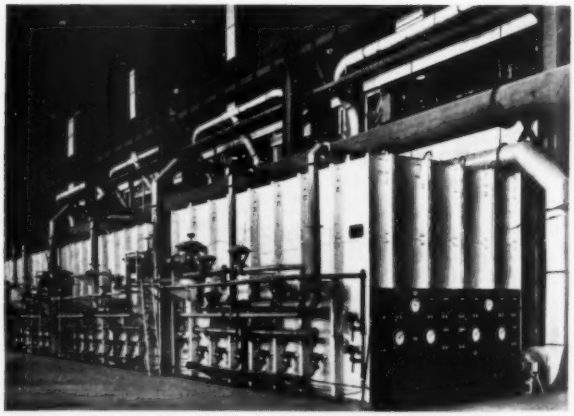
NETHERBY · QUEENS ROAD · WEYBRIDGE · SURREY

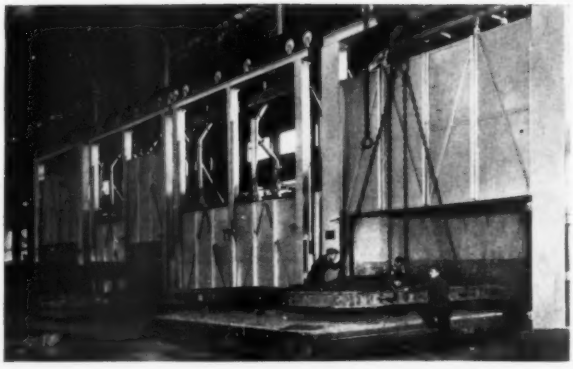
Weybridge 3891

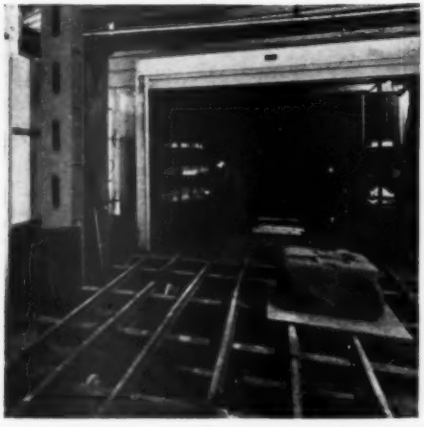
Associated with Efco Ltd. and Stein & Akinson Ltd.

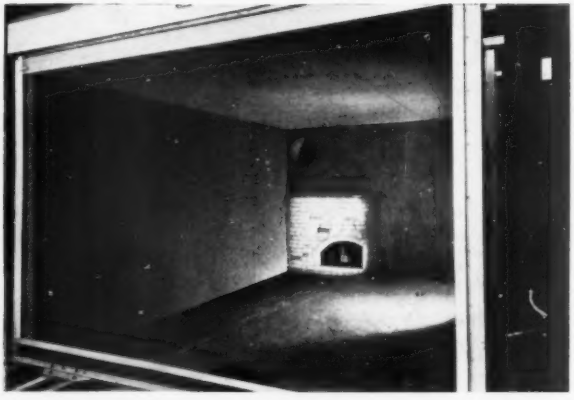
MOULD & CORE DRYING STOVES

HOT GAS RECIRCULATION BY LARGE CAPACITY FANS COMBINED WITH AUTOMATIC CONTROL OF TEMPERATURE ENSURES RAPID AND UNIFORM DRYING WITH LOW FUEL COSTS.









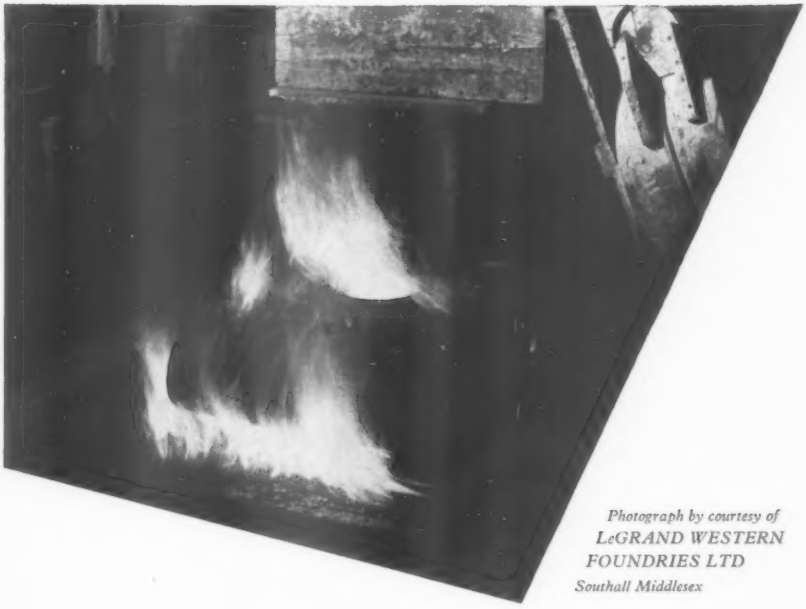
DOWSON & MASON LTD

ALMA WORKS LEVENSHULME MANCHESTER

Telephone: HEATON MOOR 6251 (5 lines) Telegrams: Gasify, Manchester 19

UGI GROUP

BIS *can help with your Sand problems*



Photograph by courtesy of LeGRAND WESTERN FOUNDRIES LTD Southall Middlesex

These leaflets may interest you— they will be sent free on request

BRITISH INDUSTRIAL SAND LIMITED · FESLENTE LIMITED

Producers of Industrial Silica Sands *Resin-coated Sands*

HOLMETHORPE · REDHILL · SURREY · REDHILL 1122

MACNAB MOULDING MACHINES

Unequalled for High Production Long Service and Low Maintenance Costs.

Half a century's

EXPERIENCE IN THE MANUFACTURE OF MOULDING MACHINES MAKES MACNAB MACHINES THE BEST FOR CLEAN, ACCURATE AND WELL FINISHED MOULDS.

SPECIAL FEATURES:

- MASSIVE YET SYMMETRICAL CONSTRUCTION.
- JOLT RAM—A REAL BLOW.
- SQUEEZES TO A SET PRESSURE.
- PATTERN DRAW—STEADY AND SMOOTH.
- AIR ON OIL CONTROL TO DRAW.
- MECHANISM SAND PROTECTED.
- PATENT AIR-LOADED DISC VALVES.

LATEST ENCLOSED SAND PROTECTED JOLT SQUEEZE MOULDING MACHINE

We manufacture many other types and sizes of Moulding Machines suitable for economical production of varying classes of work.

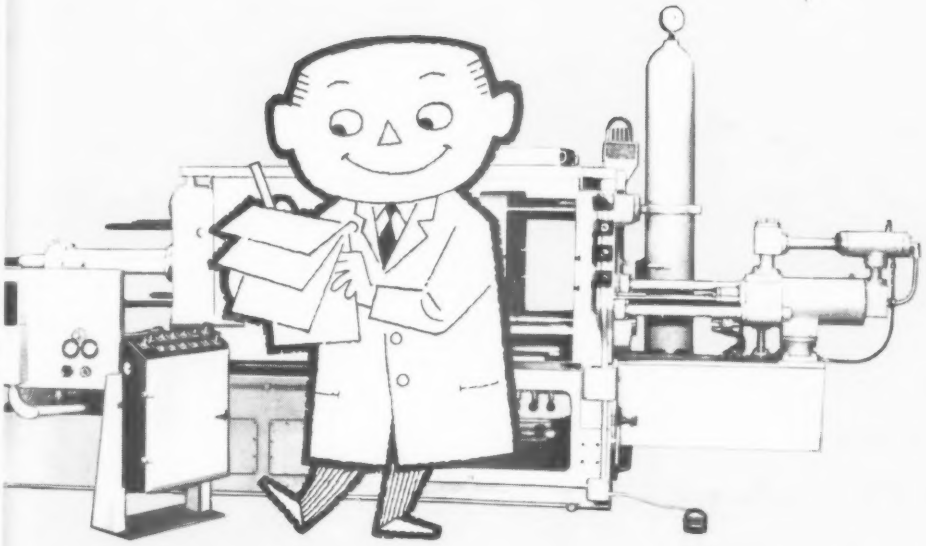
Catalogues giving full details will be sent on request.

MACNAB and Company Limited

PRESTIGE HOUSE
235 IMPERIAL DRIVE

HARROW

Telephone: PINNER 0600



Peco Point of Control — superb instrumentation — ensures that every PECO die-casting machine does its job properly, quickly, profitably. No delays. No re-adjustment on the run. PECO instruments do not vary. Semi-automatic or manual working is easier than ever before. Everything under precise control means exceptionally high output. See for yourself. Look at the "specs". Write or telephone now. They'll be on your desk in the morning.

Extra PECO advantages :

* Independent instrument cabinet
* The world's most dependable instruments
* Complete control over every operation

La gamme si considérable des machines PECO de moulage sur matrices améliore de beaucoup la production et la qualité des produits. Nous sommes toujours disposés à envoyer sur demande aux intéressés des détails supplémentaires et les "spécifications unifiées mondiales" des machines PECO.

PECO MACHINERY SALES (Westminster) LIMITED
28 Victoria Street, London, S.W.1
Sales: ABBey 1793. Service: MACaulay 1212. Cables: Pecomatic London. Telex: 23312

ROWLAND

16" – 20" C04 FOUNDRY TYPE ABRASIVE WHEEL CUTTING OFF MACHINE

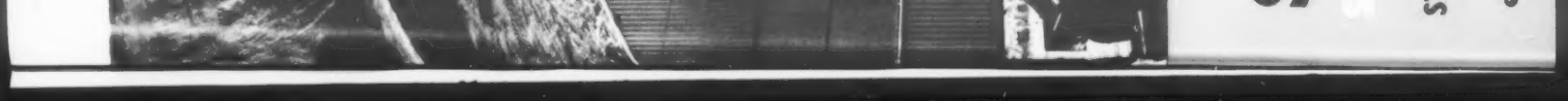
- ★ UNIVERSAL IN CHARACTER
- ★ EXCEPTIONAL RIGIDITY
- ★ EXTREME SIMPLICITY
- ★ 10, 20 OR 30 H.P. MOTORS AVAILABLE
- ★ POSITIVE NON-SLIP DRIVE
- ★ EARLY DELIVERY

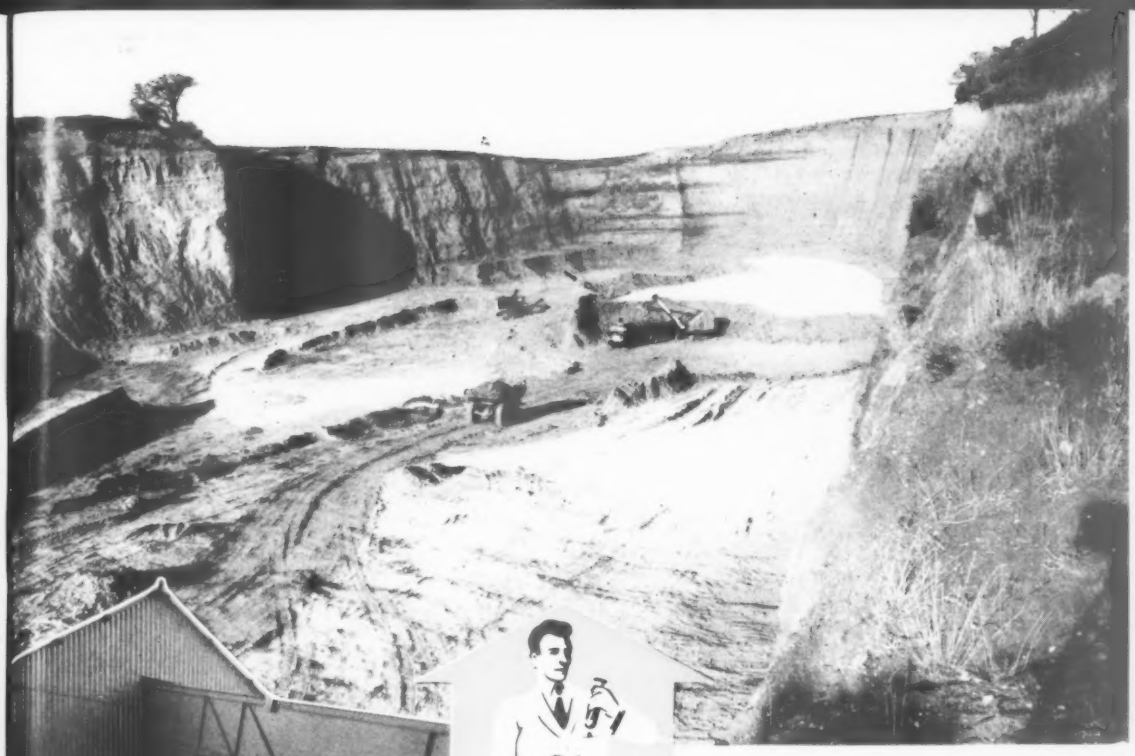
This entirely new machine is the culmination of many years experience in this field. Designed expressly for foundry use, risers and gates of up to 3 in. dia. on a wide variety of castings can be cut off neatly in astonishing times.

Why not consult us, we may be able to help you.

F. E. ROWLAND & CO. LTD.
REDDISH NR. STOCKPORT
TEL. HEA 3201

Sole Export Agents: MESSRS. D. A. (SALES) LTD. HALIFAX HOUSE, STRAND, W.C.2.
TEL. TRA 7229





controlled consistency

STANLEY N. EVANS

Suppliers of High Grade Moulding Sand

STANLEY N. EVANS LTD. SERPENTINE ROAD, HARBORNE, BIRMINGHAM, 17

TELEPHONE HARBORNE 0409

QUARRIES FAIRFIELD BROMSGROVE WORCESTERSHIRE

Nitrided
MOULDING
BOX
BUSHES
can save you money in six ways all at the same time.
1. STANDARD SIZES — ODS and bores are sized to enable standard reamers and barstock to be used on the box without further machining.
2. LONG LIFE — BAC Nitrided Bushes at over 1050 VDN outlast the ordinary bush many times.
3. ACCURACY — Limits held to .002" on diameter or across flats. Less scrapped castings!
4. RADIUSED INNER CORNERS — A detail refinement which improves performance.
5. RADIUSED LEAD-IN — Speeds up insertion.
6. AVAILABILITY — All standard sizes in stock.
It pays to bush with
B·A·C
The bush . . . . . with 9 lives
BUSHES
Save scrap!
BORE PLUS
O.D's PLUS
¼" RADIUS
BRITISH AERO COMPONENTS LTD., MONTAGUE ROAD, WARWICK. TELEPHONE

By day—and by night, FORDATH **products play** their part in the surging activity of the foundry.

By tanker, and by drum FORDATH's Permol Core Oils, Glyso Core Compounds and Exol Cereal Binders flow into foundries throughout the land.

Shell-Mould shops receive their essential PLASTSAND, or where they have installed FORDATH Sand Coating Equipment they wisely base their production of trouble-free shell sand on FORDATH Phenolic Resins.

FORDATH

Full details from:
THE FORDATH ENGINEERING COMPANY LIMITED,
BRANDON WAY, WEST BROMWICH, STAFFORDSHIRE
Cables: "Metallical" West Bromwich Phone: WEST Bromwich 1665

B·O·A·C *takes good care of you*

—with ILFORD Industrial B X-ray film

High among the priorities of BOAC is safety. Behind the scenes at London Airport is some of the world's finest equipment, operated by highly trained personnel to ensure the reliability of every detail that contributes to safe operations.

Where even the smallest foreign particle may imperil life, nothing is left to chance. Complex units, such as engine oil coolers which cannot be dismantled for inspection, are therefore radiographically examined to detect accumulations of sludge, metal debris, and carbon particles which would spell danger if they circulated in the engine lubrication system.

For this examination, British Overseas Airways Corporation relies on ILFORD Industrial B X-ray film. Ilford has a reputation for reliability.

Where reliability is all-important

ILFORD

ILFORD LIMITED · ILFORD · ESSEX

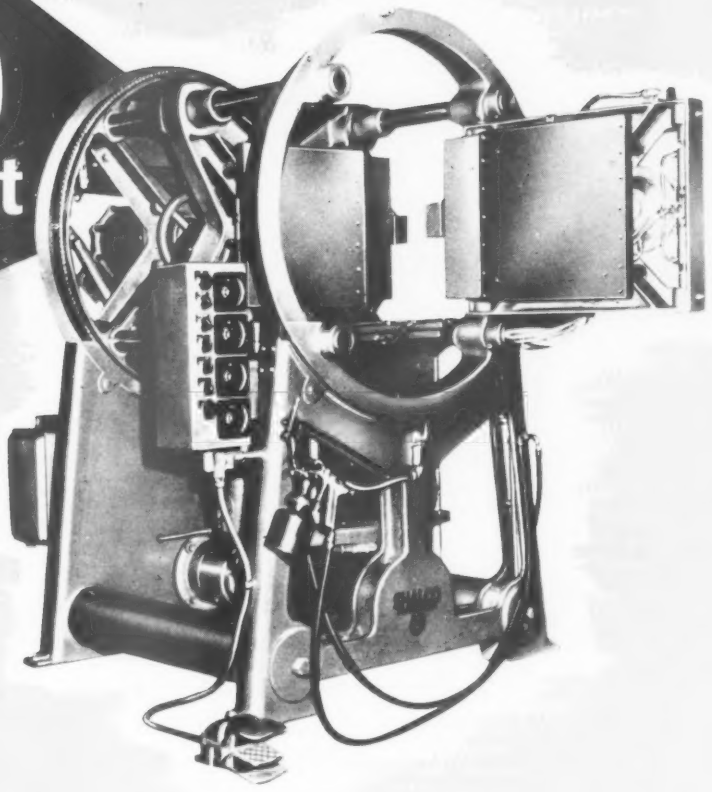
An
SE
ach
BE
LE
SIN
LO
CO
CL
OTHE
M.
in 5
BRI

The U180

fully automatic

SHELL CORE BLOWER

Another SHALCO achievement



- BETTER CORES IN LESS TIME.
- SIMPLE OPERATION.
- LOWER COST PER CORE.
- CLEANER CASTINGS.

OTHER SHALCO MODELS:
M.C.M.5 Semi-Automatic in 5 sizes · M.C.3 Manual.

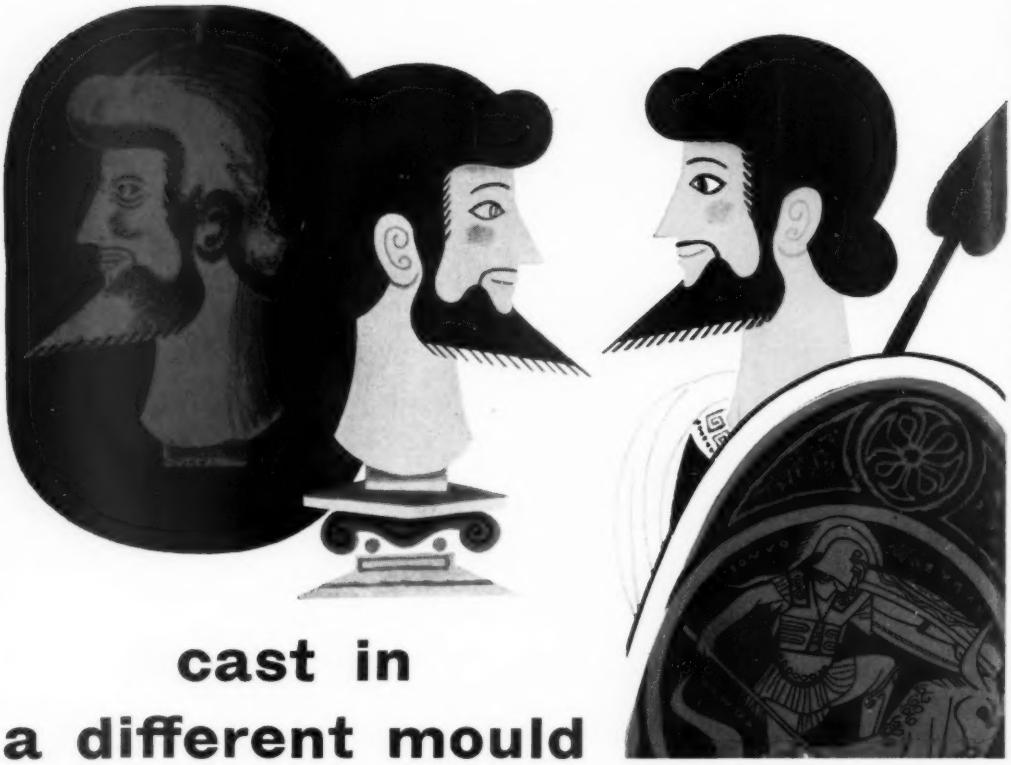
AUTOMATICALLY CONTROLLED CYCLE

The operator merely places the core box in position and presses the foot pedal. The U180 does the rest.
Investing, blowing, rocking and curing cycles are controlled by adjustable timers. The U180 is complete in itself—separate driers and ovens are eliminated.

C

BRITISH BUILT | UNDER LICENCE BY

THE COLEMAN-WALLWORK
FOUNDRY EQUIPMENT DIVISION
OF STONE-WALLWORK LIMITED
32 VICTORIA STREET, LONDON, S.W.1. *Tel: ABBEY 7681*



cast in a different mould

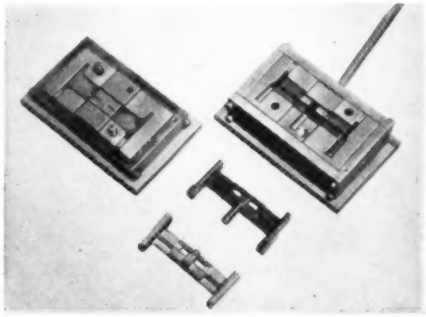
Dies for producing wax patterns are conventionally made of bismuth tin alloy. However, these tend to be costly in production and dimensionally unstable when cooling. That is why

TRUCAST LIMITED

decided to use Shell Chemical EPIKOTE resins for their wax injection dies. They realised that EPIKOTE resins would save time and money whilst giving superior performance all round . . .

The formulation based on EPIKOTE resins is half the cost of soft metal alloy; the number of man-hours during production is considerably reduced; dimensional stability is increased; greater abrasion and impact resistance give improved wear characteristics.

Here, as in many other applications, EPIKOTE resins have not only overcome initial production difficulties but now offer a constantly high standard of quality and performance.



SHELL

S.S.27.

EPIKOTE RESINS

SHELL CHEMICAL COMPANY LIMITED

Marlborough House, 15-17 Gt. Marlborough Street, London W1

YOU CAN BE SURE OF SHELL CHEMICALS

"SHELL" *and* "EPIKOTE" *are Registered Trade Marks*

FOUNDRY TRADE JOURNAL

Vol. 108 May 12, 1960 No. 2266

Established 1902

Incorporating

IRON & STEEL TRADES JOURNAL

Single copy 1s.; by post 1s. 4d. Annual subscription: home 52s., abroad 60s. (prepaid)

Editor:
V. C. FAULKNER, F.R.S.A., HON.M.I.B.F.

Assistant Editor: A. R. PARKES, M.I.B.F.
Commercial Editor: P. E. CARDEN.

Advertising Manager:
F. BARRINGTON HOOPER, B.A.
Production Manager:
R. J. LOVELL

Publisher: H. J. DWYER
Circulation Manager: E. T. GRIFFITHS

District Representatives:
G. P. ELLIOTT (Northern Area) 'phone: Altrincham 1334
T. H. SMITH (Scotland) 'phone: Dumbarton 1046
D. C. RYALL (Southern Area) 'phone: TRAfalgar 6171

The FOUNDRY TRADE JOURNAL is the official organ of the British Steel Founders' Association; Association of Bronze & Brass Founders; the Light Metal Founders Association; Foundry Trades' Equipment & Supplies Association and the National Society of Master Patternmakers.

AN INDUSTRIAL NEWSPAPERS PUBLICATION

Published Every Thursday by Industrial Newspapers, Limited

BARRINGTON HOOPER, C.B.E., *Chairman and Joint Managing Director*
F. BARRINGTON HOOPER, B.A., *Joint Managing Director and Commercial Director*
F. R. LEWIS, JOHN HOOPER, D. HORN *Directors*
E. G. WESTON, *Director and Secretary*

JOHN ADAM HOUSE, 17-19, JOHN ADAM STREET, ADELPHI, LONDON, W.C.2

Telephone: Trafalgar 6171 (Private Branch Exchange)
Telegraphic Address: "Zacatecas, Rand, London."

PRINCIPAL CONTENTS

PAGE

Filler-rod for the Gas-welding of S.-g. Iron

By R. H. T. Dixon, A.I.M., A.C.T.(Birm.), and D. R. Thorneycroft

Development of a filler-rod for the gas-welding of s.-g. iron, which itself has a basic structure similar to the metal to be welded, but with the addition of a substantial percentage of nickel 583

Failure of Employers to adopt Usual Precautions—Is this Negligence ?

By "Barrister-at-Law" 591

Tige de Remplissage pour la Soudure au Gaz de la Ductile. Par R. H. T. Dixon, A.I.M., A.C.T. (Birm.) et D. R. Thorneycroft.
Développement d'un tige de remplissage pour la soudure au gaz de la ductile, ayant elle-même une structure de base semblable à celle du métal à souder, mais avec addition d'un pourcentage considérable de nickel 583

Omission par certains Patrons d'adopter les Precautions habituelles.—Est-ce de la Négligence? Par "Barrister-at-Law." 591

Schweissdraht für die Gasschmelzschweissung von Kugelgraphiteisen. Von R. H. T. Dixon, A.I.M., A.C.T. (Birm.), and D. R. Thorneycroft.
Entwicklung eines Schweissdrahtes für das Gasschmelzschweissen von Kugelgraphiteisen, dadurch gekennzeichnet, dass dieser im Wesentlichen das gleiche Gefüge wie das zu schweissende Metall hat, dem jedoch Nickel in grösseren Mengen zugesetzt wurde 583

Ist die Unterlassung üblicher Vorsichtsmassnahmen seitens eines Unternehmers eine Fahrlässigkeit? Von "Barrister-at-Law." 591

Features, News, Commercial Information and Statistics

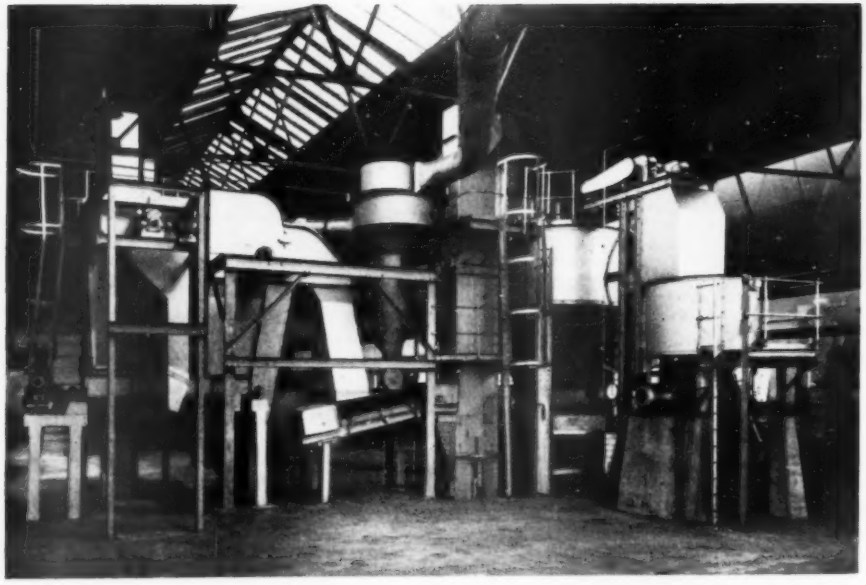
Leader: What's in a Name? 581
British S.G. Iron Producers' Association 582
Company News 590
Dinner : Iron and Steel Institute 592
Notes from the Branches 595
Smoke, Grit and Dust in Liverpool, Manchester, and Sheffield .. 600
Forum on Combustion Problems 600
European Foundry Apprentice Competition 600
Personal 601
News in Brief 603
AFS Congress and Exhibition 604
ESC Bogie Frames for Chile 604
IVE Annual Conference 604
Raw Material Markets 606
Current Prices of Iron, Steel and Non-ferrous Metals 608

IT'S NEW

August's LIMITED

Coolevayor

to cool your SAND



Photograph by courtesy of
DUPORT FOUNDRIES LIMITED

● Photograph shows compact sand reconditioning and preparation plant comprising, left to right, elevator, rotary screen and tailing chute, screw conveyor,

COOLEVEYOR AND CYCLONE UNIT,

elevator, storage hopper with rotary table feeder to bucket loader to 1½F size Mix-Muller and aerator.

AUGUST'S LIMITED · HALIFAX · ENGLAND

Telephone: Halifax 61245/6/7/8. Telegrams: August, Halifax

Sole Licensees and Manufacturers for the British Empire (excluding Canada, Australia and New Zealand) of the Simpson Sand Mixer.

J.J.M.

FOUNDRY
TRADE JOURNAL

Vol. 108 May 12, 1960 No. 2266

What's in a Name?

It is abundantly clear that heads of some of the largest combines are deeming it desirable to eliminate or modify the names of the constituent or associated companies so as to aggrandise the name of the parent company. Even where this is not done, there is a tendency to weave in the name of the overall enterprise. Publicity conveyed by the firm's name does not always stop there, as in many cases, press notices start with " Mr. Bloggs, president of the International Foundry Enterprises, announces something or other." These large concerns should really make up their minds on what aspect to pinpoint name publicity. Other concerns, wisely to our minds, focus attention on that member of their constituent enterprises doing business in a particular field and minimise its association with the industrial empire. This represents a realisation that publicity for a holding company does not promote sales for one of the links in its chain.

Psychologically, the best name for a firm is one like Samuel Fox, for although the originator may have been dead for 60 or 70 years, people having dealings with firms carrying such personal names, subconsciously think that if anything goes wrong, they can approach Mr. Fox personally for redress. There is probably more goodwill in the names of old-established concerns than the publicity experts will allow. They attach much significance to the prestige of the industrial empire and in this they are unquestionably right, but the smaller colonies of the empire do like to appear as if they still have a measure of independence and an individuality.

At the moment, the Editor has on his desk a list of companies controlled by a well-known finance house, numbering, it is estimated, about 200 concerns. Included in the list are about a dozen concerns, either actual foundries or in an allied field. Before seeing this list he was ignorant of these firms' association with the financial group and can only hope that they will resist any attempt to have their identity sunk by the creation of some overall title. In this case, it is not expected to happen, as the parent company is a purely financial undertaking, yet one of the firms controlled is itself a huge manufacturing enterprise which could absorb a number of the others. The goodwill established by firms with great reputations—and now maybe a part of a huge holding—is a national asset of real worth. The great industrial tycoons should think twice before reducing to zero the considerable commercial resources implied and inherent in the names of firms long respected in industry.

British S.G. Iron Producers' Association

Annual Meeting and Luncheon in London

The annual meeting of the British S.G. Iron Producers' Association was held at the Connaught Rooms, London, on Thursday, May 5, under the chairmanship of Mr. H. J. V. Williams (of John Williams of Cardiff, Limited). The morning session was devoted to business meetings and these were resumed in the afternoon. At the luncheon, however, the chairman welcomed a number of guests by name, including Mr. H. Morrogh (director, British Cast Iron Research Association), and Dr. L. B. Pfeil, O.B.E., Dr. A. B. Everest, B.SC., F.I.M., and Mr. W. W. Braidwood (all the last-named being from the Mond Nickel Company, Limited), in addition to members of the technical Press.

Mr. Williams continued by pointing out that the Association was now in its seventh year; throughout the whole time, spheroidal-graphite iron production had risen steadily. Last year's increase was especially pleasing, he said, having in mind the adverse conditions encountered during that year by the foundry trade generally. Membership of the Association now approximated 40 firms, although there had been individual changes caused by some members relinquishing their licences and by new licences being granted. As an Association, members did everything possible to promote and increase knowledge of every aspect of s.-g. iron. Particularly was this so in the technical sphere, where the Association's first one-day conference, held under the chairmanship of Mr. Berry, had developed into the formation of technical committees on a geographical basis, in which all members participated, and whose activities were co-ordinated by a technical panel under the able chairmanship of Mr. G. Greig. The panel was now in process of organising the second conference which was to take place in London next November, spread over two days.

Members' faith in s.-g. iron remained undiminished, Mr. Williams continued, and applications for this new and proved material increased with growing consciousness by users of its value and their increasing willingness to utilize its merits by redesigning components to suit the metal. This was already reflected in demands for a revision of the B.S.I. specification for s.-g. iron (2789) which was now being undertaken to include the much wider range of qualities now available than existed when the specification was first introduced in 1956. In closing, Mr. Williams thanked all the members of the Association for their support.

World Production

Dr. Pfeil responded briefly on behalf of the guests, thanking members of the Association for their hospitality, and mentioning that the production of s.-g. iron in the free world now exceeded 1½ million tons, of which about 315.00 tons were produced in 1959. This was from among 520 licensees of the Mond Nickel Company, distributed over 30 countries. He also mentioned the forthcoming international conference on s.-g. iron scheduled to commence on September 8 in Austria.

The luncheon closed on the passing of a vote of thanks to the chair on the proposal of Mr. P. B. Lake (Lake & Elliot, Limited). Thereafter the meetings of the Association continued during the afternoon.

Elections announced subsequently were: Mr. H. J. V. Williams to continue as president of the Association, Mr. P. B. Lake to be vice-president, Mr. P. A. Russell, honorary treasurer and Mr. G. Greig, chairman of the technical panel.

APV's Golden Jubilee

On June 10 this year, the A.P.V. Company, Limited, celebrates the fiftieth anniversary of its foundation. The company was started in Wandsworth, London, in 1910, by Dr. Richard Seligman, as the Aluminium Plant & Vessel Company, Limited, to develop commercially a patent for the welding of aluminium. It was the first company to produce large vessels in aluminium as the industrial application of this metal had previously been handicapped by the difficulty in welding.

The subsequent development of welded fabrication in aluminium, and later in stainless steel, the invention of the Paraflow plate heat-exchanger in 1923, and the growth of the company as process engineers, built the APV company up as one of the leading manufacturers of process plant for the dairy, brewery, food, chemical and related industries.

To-day the company employs nearly 2,000 people in its factory at Crawley, Sussex, and it has created a large overseas organisation based on eight associated companies, four of them with their own factories.

During these 50 years of steady, healthy growth APV has retained its independence, and its founder, Dr. Richard Seligman, although now retired from the chairmanship, is still with the company as president.

Forthcoming Events

MAY 18

Institution of Plant Engineers

London area: "Factory Safety," by a member of H.M. Factory Inspectorate, 6.30 for 7 p.m., at the Royal Society of Arts, John Adam Street, Adelphi, London, W.C.2.

MAY 19

Combustion Engineering Association

Midland region: Discussion on "The Automatic Boiler House," opened by Mr. M. A. Beechley, 10.15 a.m., at the Birmingham Exchange and Engineering Centre, Birmingham.

Institute of Vitreous Enamellers

Northern section: Annual general meeting and dinner, 7.30 p.m., at the Old Nag's Head Hotel, Jackson's Row, Manchester, 2.

MAY 20

Institute of British Foundrymen

Sheffield branch: Annual dance, 8 p.m., at the Brincliffe Hall (off Psalter Lane), Sheffield.

MAY 21

National Society of Master Patternmakers

Annual general meeting, 3.30 p.m., at the Grand Hotel Brighton, followed in the evening by annual dinner dance.

IVE Works Visit

A works visit to the North Thames Gas Board, Watson House, Townmead Road, Fulham, London, S.W.6, on May 18, has been arranged for the southern section of the Institute of Vitreous Enamellers. The tour will commence at 2.30 p.m. from the Exhibition Entrance of Watson House. Members, ladies and guests are invited to join in the visit, which will include the various laboratories of the company, where *inter alia* methods of testing vitreous enamel and the use of gas in vitreous enamelling will be shown. It is hoped that a sufficient number of ladies will attend to warrant a special programme being incorporated for them. The secretary, Mr. L. E. Turner, asks for applications to be made to him as early as possible before May 16.

Filler-rod for the Gas-welding of S.-g. Iron

*By R. H. T. Dixon, A.I.M., A.C.T. (Birm.), and D. R. Thorneycroft, B.Sc., A.I.M.**

This paper traces the development of a nickel-bearing s.-g. iron filler-rod with improved deposition characteristics and weld-metal properties, for use in the oxy-acetylene welding of spheroidal-graphite grey cast-irons.

Spheroidal-graphite cast-iron[1, 2] is now a well established engineering material, having, in the as-cast condition, a unique and desirable combination of properties, certain of which can be enhanced by heat-treatment. The three standard grades used for engineering purposes, one pearlitic and two ferritic, are covered by BSS No. 2789, which gives full details of the mechanical properties obtainable in the respective conditions.

The design of some types of equipment for which spheroidal-graphite iron castings are used involves welding; Fig. 1 shows a typical example. Of the several welding processes which have been applied to these irons, the metal-arc method is one of the more attractive, since in this process distortion due to the heat of welding is readily controlled and welding is relatively rapid. The successful application of metal-arc welding to the three grades of s.-g. iron, using nickel-iron electrodes, has been described by one of the authors[3]. Other researches have shown that the irons can be welded satisfactorily by argon-shielded and submerged-arc welding processes[4]. German investigators[5] have described conditions for producing satisfactory flash-butt welds, and an interesting application of this process, the flash-butt welding of s.-g. iron pipe, comes from Sweden[6]. The bronze welding of s.-g. iron has so far received only little attention, but the results of laboratory tests by one of the authors (summarized in Table 1) suggest that the process will give joints which may be suitable for certain assemblies.

TABLE 1.—*Mechanical Properties of Bronze Welds in Two Grades of S.-g. Iron made with 15-per cent. Nickel Rod conforming to BSS 1453/ Type C6.*

Type of iron.	Yield strength (tons per sq. in.).	Ultimate tensile strength (tons per sq. in.).	Elongation (per cent. on)	
			½ in.	2 in.
Pearlitic ..	30.5	33.7	4	1½
	n.d.	28.8	6	½
Ferritic ..	20.0	29.5	30	12

n.d. = not determined.

Need for a Special Filler-rod

In addition to applications for which welding by one or other of the above processes is appropriate, there are certain instances where oxy-acetylene welding would be the most suitable method, provided that an adequate welding-rod were available. Welding by this process would be suitable, for instance, for deposition of a small quantity of s.-g. iron in the reclamation of castings in the foundry, for replacement of s.-g. iron surfaces worn in service, or for composite assemblies which incorporate castings, where it is important that the composition, structure, and properties of the weld metal shall be closely similar to those of the parent material. Although previous investigations[7, 8] of the gas-welding process had shown that joints of reasonable strength could be obtained by using filler-rods of a modified s.-g. iron composition, it had been found that in order to ensure such properties, special precautions were needed during welding. It was generally accepted, therefore, that there was a need to improve both the deposition characteristics of the rod and the properties of the deposited weld metal. This paper traces the development of

FIG. 1.—*Typical welded component, in s.-g. iron.* (*Courtesy*: British Timken, Limited)

* The authors are with Mond Nickel Company, Limited development and research department.

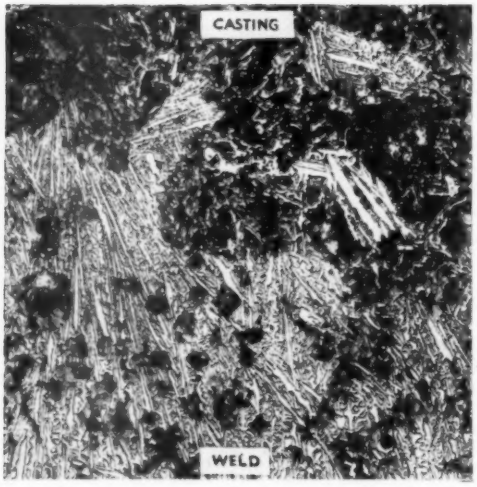


FIG. 2.—*Photomicrograph showing a quantity of eutectic carbide in s.-g. iron weld deposits. (Etched, × 100).*

a nickel-bearing s.-g. iron filler-rod which substantially meets these requirements.

Composition

A characteristic feature of weld metals deposited from rods of s.-g. iron of normal composition is the presence of eutectic carbide, as shown in Fig. 2. The amount of carbide present increases as the weld-size is reduced. The presence of this phase is undesirable; it causes the weld metal to be brittle and to have a high hardness, and the carbide can be removed, and the weld metal made soft and ductile, only by a prolonged high-temperature heat-treatment. Table 2, which gives the mechanical properties of gas welds made in ½-in. plate of pearlitic s.-g. iron by means of a conventional s.-g.

FIG. 3.—*Photomacrograph of porosity in oxy-acetylene welds made with high-aluminium s.-g. iron rods. (Etched, × 3).*

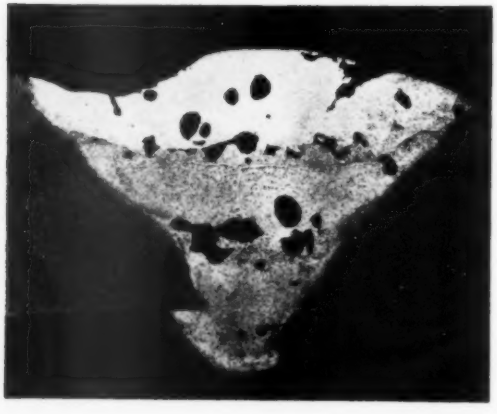


TABLE 2.—*Mechanical Properties of Oxy-acetylene Welds in ½-in. S.-g Iron Plate made with a Rod containing 3.4 C, 2.1 Si, 0.35 Mn, 0.8 Ni, 0.08 Mg, 0.01 S and 0.03 per cent. P.*

Property.	Pearlitic plate.	Welded joints.*
Ultimate tensile strength (tons per sq. in.)	40–50	18–27
Elongation on 2 in. (per cent.)	2–5	2–2½
Charpy impact strength (unnotched, ft.-lb.)	10	3½–6½

* All failures on centre line of weld.

iron rod, clearly demonstrates the low tensile and impact strengths of the weld deposits. Similar welds made with a flake-graphite cast-iron rod conforming to BS 1453, Type B3 (C 3 to 3½, Si 2 to 2½, Mn ½ to 1, Ni 1¼ to 1¾, S 0.1 max. and P 0.5 per cent. max.), intended for welding high-duty flake-graphite cast-iron, developed only 16 tons per sq. in. tensile strength and ½ per cent. elongation.

Selection of Best Chemical Composition

On the assumption that a rod suitable for welding s.-g. iron should contain graphitizing elements, in order to prevent formation of eutectic carbide during welding, a number of filler-rods were made having compositions in the following range: Ni 1 to 7, Al 0.05 to 1, C 3 to 4, Si 2 to 3, Ca nil to 0.01, Ce nil to 0.05 and Mg 0.04 to 0.1 per cent. The usual carbide-forming elements were excluded; in particular, chromium and manganese were kept below 0.1 per cent., although the effect of manganese was afterwards investigated over the range 0.1 to 0.3 per cent. Initial tests with these rods consisted in depositing single beads on the surface of s.-g. iron, and making butt-welds in ½-in. plate. Examination of the microstructures of the deposits established the importance of controlling the contents of the elements listed above. From the results, a preferred composition of C 3.8, Si 2.5, Ni 5, Mn 0.1, Al 0.06 and Mg 0.06 per cent. was selected for use in subsequent tests[9]. Silicon was restricted to 2.5 per cent. because of its known adverse effect upon impact properties[10]. Aluminium proved to be an effective deterrent to carbide formation, but in amounts exceeding 0.2 per cent. it seriously impaired the flow of the weld metal, even when special fluoride-bearing fluxes were used. The results indicated, however, that the presence of a small percentage of aluminium strengthened the effect of nickel in preventing formation of carbide; Table 3 shows the interdependence of the two elements. Deposits made with low-nickel high-aluminium rods showed gross porosity (see Fig. 3). The elements cerium, calcium and magnesium, which are known to render eutectic carbide unstable, had no marked effect on the matrix structure of the weld deposit, but since in the case of calcium it was not possible to retain more than 0.007 per cent. in the rod, the possible effect of this element could not be fully assessed.

Mechanical Properties

Using the rod of the preferred composition, butt joints were made in ¼, 1 and 2-in. thick plate of

TABLE 3.—*Structure and Soundness in Oxy-acetylene Welds deposited from Rods containing C 3.7, Si 2½, Mn 0.1 and Mg 0.08 per cent., and various Amounts of Nickel and Aluminium.*

Type of weld.	Aluminium content (per cent.).	Nickel content (per cent.).		
		1.	2.	3.
Butt weld in ½-in. plate	0.05	No porosity 15–20 per cent. ferrite 5–15 per cent. carbide	No porosity 5–10 per cent. ferrite No carbide	No porosity Acicular ferrite* No carbide
	0.1	Slight porosity 20 per cent. ferrite 10 per cent. carbide	Slight porosity 25 per cent. ferrite No carbide	No porosity Acicular ferrite No carbide
	0.2	Severe porosity 20 per cent. ferrite 15 per cent. carbide	Severe porosity 10–15 per cent. ferrite No carbide	No porosity Acicular ferrite No carbide
	0.5	Severe porosity 15–20 per cent. ferrite 10 per cent. carbide	Severe porosity 5 per cent. ferrite No carbide	Severe porosity Acicular ferrite No carbide
Single-bead on plate surface	0.05	No porosity 5 per cent. ferrite 25 per cent. carbide	No porosity 5 per cent. ferrite 15–20 pre cent. carbide	No porosity Acicular ferrite No carbide
	0.1	—	—	As above
	0.5	Severe porosity 15 per cent. ferrite 10-15 per cent. carbide	—	As above

* At the 5-per cent. nickel level, the change from massive to acicular ferrite made quantitative estimation difficult.

pearlitic s.-g. iron. Normal welding procedures were employed, including the use of a proprietary gas-welding flux normally used for cast iron. The various joint preparations are shown in Fig. 4, and the macrostructures of typical welds are reproduced in Fig. 5. The tensile properties of these joints are given in Table 4. The excellent quality of weld produced by the new rod is reflected by the satisfactory level of properties obtained, both in the as-welded condition and after ferritizing heat-treatment. Some comment is called for on the elongation value of the joints after the ferritizing heat-treatment; these in no instance exceeded 9 per cent., whereas the parent material in that condition

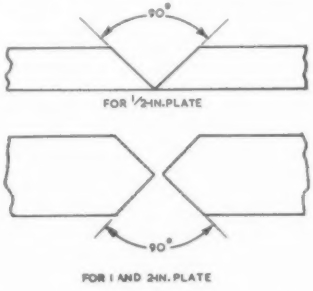


FIG. 4.—*Diagram showing the design of joints used in the welding tests.*

would show an elongation of 12 to 20 per cent., measured on the same gauge length. The lower ductility of the welded joint is considered to be due to the very fine form of the graphite spheroids in the weld deposit: as pointed out by Eckel in the study of the ferritization of s.-g. iron[11], material of a fine graphitic structure gives poor ductility figures. Tensile data for all-weld-metal samples, given in Table 5, confirm the excellent level of properties obtainable with the filler-rod.

Impact Strength

A useful characteristic of the spheroidal-graphite cast-iron is that, given suitable matrix structure, it develops substantial impact strength. This property

FIG. 5—*Macrostructures of oxy-acetylene welds made with 5-per cent. nickel s.-g. iron rod, in (top) ½-, (middle) 1- and (bottom) 2-in. plate. (Etched, ×¾)*

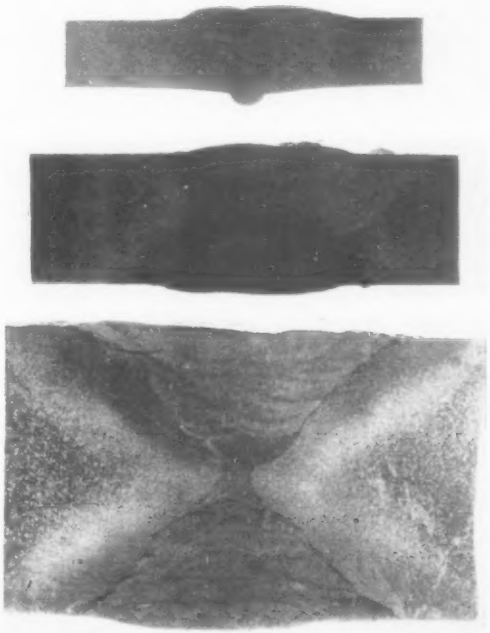


TABLE 4.—*Tensile Properties of S.-g. Iron Gas-welds made with the 5-per cent. Nickel Rod.*

Thickness of plate (in.).	Type of weld.	Treatment of weld.	Size of test-piece (in.).	Tensile properties.			Location of fracture.
				Y.S. (tons per sq. in.).	U.T.S. (tons per sq. in.).	Elongation on 2 in. (per cent.).	
½	Single-vee	None	1 by 0.45	33.5 40.0 37.9	46.7 46.5 42.5	2½ 2½ 2	Centre of weld Centre of weld Edge of weld
		3 hr. at 900 deg. C. + 16 hr. at 700 deg.C.	1 by 0.44 .. .. 1 by 0.51 .. .. 1 by 0.44	25.8 23.7 27.0	29.4 27.8 29.6	7 5½ 5½	Edge of weld Edge of weld Edge of weld
1	Double-vee	None	1 by 0.875	36.1 31.0 36.6	37.6 37.0 40.2	2 2½ 2½	Edge of weld Edge of weld Edge of weld
		3 hr. at 900 deg. C. + 16 hr. at 700 deg.C.	1 by 0.88	25.0 23.4 24.5	28.0 29.5 28.0	6½ 9 8	Centre of weld Plate near weld Centre of weld
2	Double-vee	None	1 by 1.13 (centre of joint)	n.d.	38.2	3	Centre of weld
			(Top of joint) 0.505 dia.	36.0 35.5	41.7 41.3	1½ 1½	Centre of weld

n.d. = not determined.

was, therefore, examined in welds made with rods of both the normal s.-g. iron, and the modified composition. Table 6 shows that higher impact strengths are obtained in welds made with the 5-per cent. nickel rods. Further tests were carried out over the temperature range +55 to −100 deg. C. on welds made with the 5-per cent. Ni rod. These welds had been given the full ferritizing treatment (3 hours at 900 deg. C. + 16 hours at 700 deg. C.), and the tests were made on unnotched Charpy impact specimens. The results are given in Fig. 6, which shows impact and fracture-transition curves for the weld metal on the centre-line of the weld. The transition temperatures for ductile-to-brittle failure shown by these curves are satisfactorily low when compared with data for the unwelded material, shown by the broken lines in the same Fig. The lower impact strengths of the weld deposit may again be attributed to the fineness of the graphite. Hardness surveys were made in the weld zone, and the curves in Fig. 7 illustrate the gradual change in hardness from plate to weld deposit; the trends observed are ascribed to the different microstructures developed during

TABLE 5.—*Results of Mechanical Tests on Weld Metal deposited from the 5-per cent. Nickel S.-g. Iron Welding-rod (Tensometer Test-bars, 1·1 in. long by 0·1785 in. dia.).*

Condition.	Mechanical-test results.				Microstructure.
	Elastic limit (tons per sq. in.).	U.T.S. (tons per sq. in.).	Hardness D.P.N.*.	Elongation (per cent.).	
Tempered at 600 deg. C. for 1½ hr. and air-cooled	43.5	47.5	333	2.5	Fine spheroidal graphite in tempered martensite with traces of ferrite.
	51.0	56.3	333	3.5	.. ..
	50.0	58.2	333	3.5	.. ..
Annealed 3 hr. at 900 deg. C. and 16 hr. at 700 deg. C.	36.7	39.0	230	8.5	Fine spheroidal graphite in fine-grained ferrite with traces of spheroidal carbide.
	36.0	41.0	230	12.0	.. ..

* Average of six determinations (20 kg. and diamond indentor).

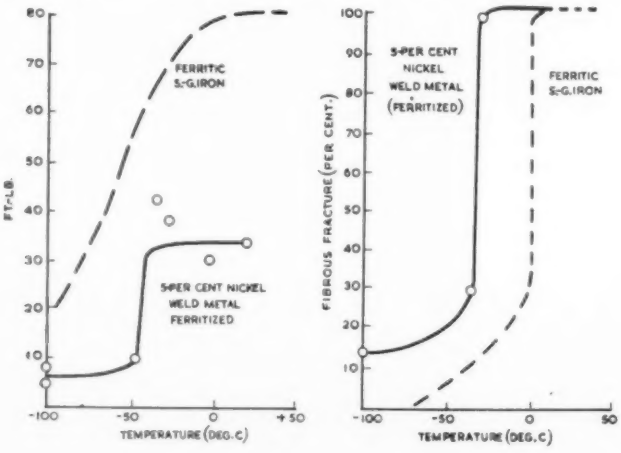


FIG. 6.—*Comparison of the Charpy impact properties of welds, and unwelded plate.*

welding in the different sizes of plate. The structures are discussed in the next section.

TABLE 6.—*Impact properties of Single-vee Butt-welds in ½-in. S.-g. Iron Plate.*

Type of rod.	Charpy impact strength.	
	Kg.m.	ft. lb. (approx.).
3.4 C, 2.1 Si, 0.35 Mn, 0.8 Ni and 0.08 per cent. Mg (normal S.-g. iron composition).	0.9 0.5 0.7	6½ 3½ 5
3.8 C, 2.5 Si, 5.0 Ni, 0.06 Mg and 0.06 per cent. Al (new rod).	1.2 1.6 1.6	9 11½ 11½

Test conditions: Temperature, 20 deg. C.; unnotched Charpy bar, 55 mm. by 10 mm. by 10 mm.; blow applied at centre of weld root.
Weld conditions: Plate material, as-cast; no post-weld heat-treatment.

Microstructures

Associated with the heat-affected zone in the parent iron were structural changes in the plate adjacent to the weld. Prior to welding, plates of all

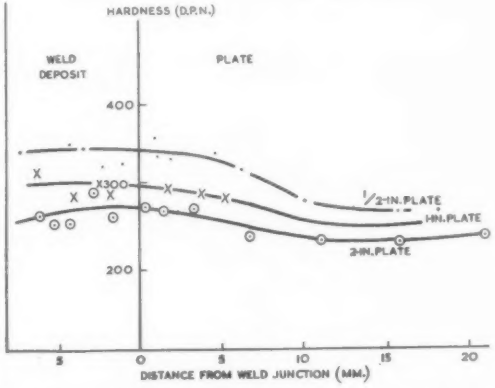


FIG. 7.—*Hardness surveys across welds in various thicknesses of pearlitic s.-g. iron plate.*

thicknesses had similar structures, consisting mainly of lamellar pearlite and spheroidal graphite, and the effect of heating and cooling on the plate was largely to refine the pearlitic structure. Due to the presence of 5-per cent. nickel in the deposits, the weld metal had higher hardenability than the adjacent plate, and therefore showed some hardening, mainly in the ½-in. section, due to more rapid cooling. In the welds in the thicker plates this hardening effect was offset by the graphitizing influence of the nickel content. Figs. 8 to 10 illustrate the microstructures of deposits on ½, 1 and 2-in. plate. In the welds on the ½-in. plate a proportion of the structure of the deposits consisted of the hard constituent martensite (see Fig. 8 (top)), but this constituent was absent from the structure of welds made on thicker sections, which consisted mainly of the softer constituents, ferrite and pearlite (see Fig. 8 (middle and bottom)). All the welds contained a considerable quantity of fine particles of spheroidal graphite (see Fig. 9).

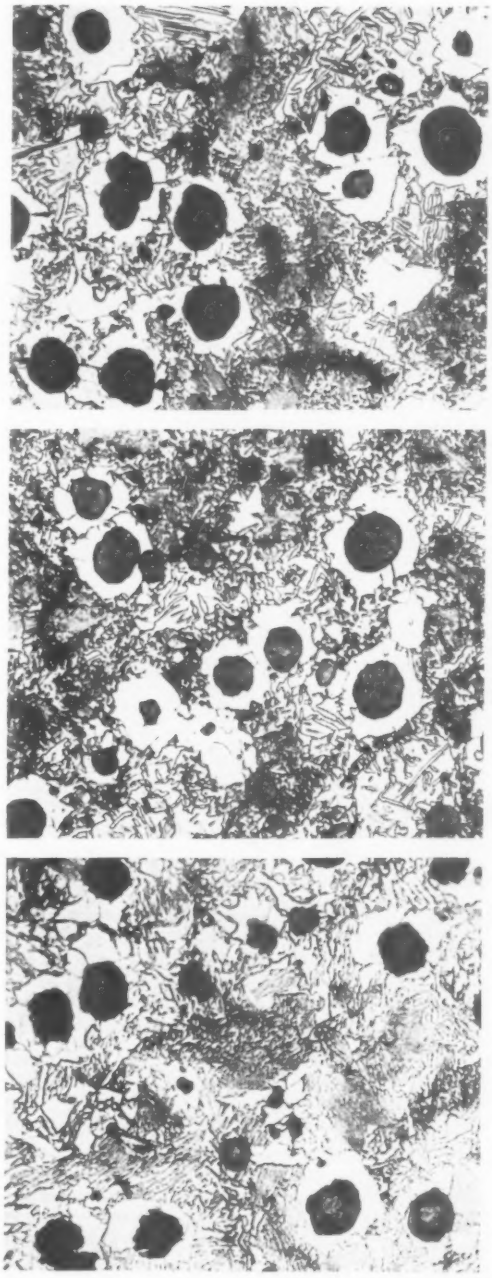


FIG. 8.—(*top*) *Weld in ½-in. plate, showing a certain amount of hard martensite, and* (*middle and bottom*) *welds in* 1-, *and* 2-*in. plate respectively.* (*All etched,* × 500).

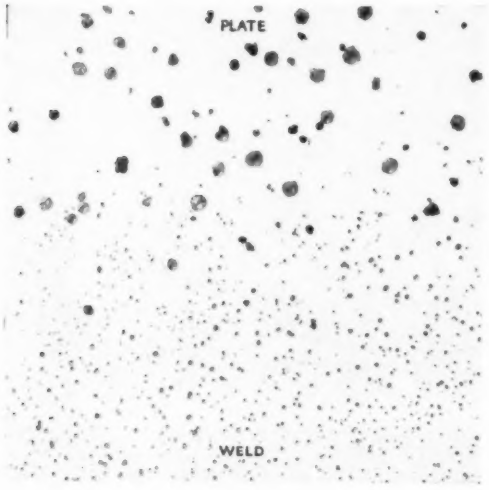


FIG. 9.—*Fine spheroidal-graphite particles in a weld deposit. (Unetched, × 50).*

Flame-tempering Treatment

An important aim of this work was to develop soft structures in small weld beads, in particular to prevent the formation of eutectic carbide. Although carbide formation was avoided by compositional changes, small beads, as deposited, contained a proportion of the hard constituent martensite. However, it was surmised that martensite would be softened by a simple flame-tempering treatment applied with the torch after welding. This assumption proved correct, as demonstrated by the hardness data given in Table 7. The microstructures of tempered weld deposits made with two types of filler-rod are shown in Fig. 10, and the good

TABLE 7.—*Comparison of Weld Hardness for Single Beads of S.-g. Cast Iron deposited from a Normal, and from a Modified, Filler-rod.*

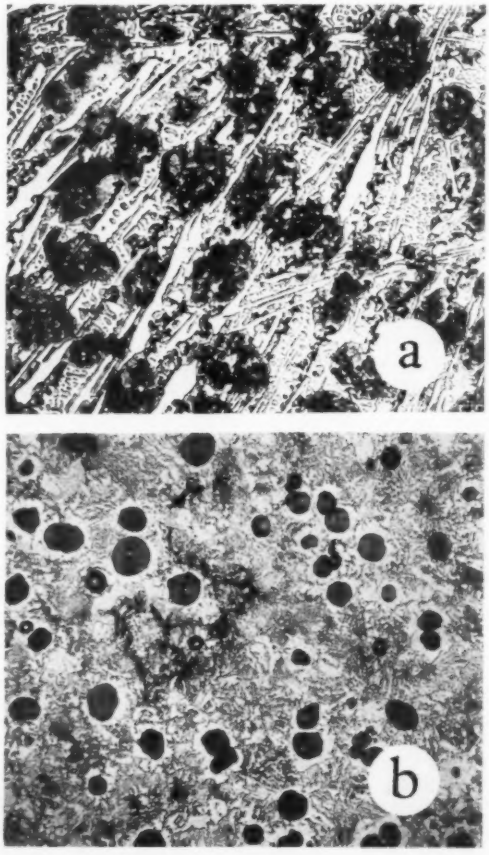
Type of rod.	Hardness (D.P.N.).		
	As-deposited.	Flame-tempered for 2 min.	Tempered 1¼ hr. at 600 deg. C.
Normal s.-g. iron	455 500 490 520 550 480	500 530 540 600 460	465 465 425 470
5-per cent. nickel s.-g. iron	405 415 415 420 415 420	330 360 340 335 340	270 285 285 280

response to tempering of the 5-per cent. nickel deposits is further illustrated by the softening obtained when a conventional tempering treatment was applied (Table 7). Obviously, the average temperature of the weld zone during the flame-tempering treatment must not rise above 650 deg. C., otherwise there is the risk of transformation to austenite, from which martensite may form on cooling. It is envisaged that flame-tempering treatment will be of practical value in such operations as the reclamation of small castings, where it is difficult adequately to retard cooling of the casting.

Laboratory Tests

The work described has resulted in the development of a filler-rod for the oxy-acetylene welding of spheroidal-graphite grey cast-irons. In laboratory tests this rod has shown attractive deposition characteristics, and has been found to give weld joints having a consistently high level of mechanical properties. In particular, the as-welded tensile strengths of joints made in pearlitic irons were 42½ to 46½ tons per sq. in. on ½-in. plate, 37 to 40 on 1-in. plate and 38 to 41½ on 2-in. plate. The welds also showed a satisfactory response to the full

FIG. 10.—*Structures of weld deposits after tempering in an oxy-acetylene flame: (a) conventional s.-g. iron rod, and (b) 5-per cent. nickel s.-g. iron rod. (Both etched, × 500).*



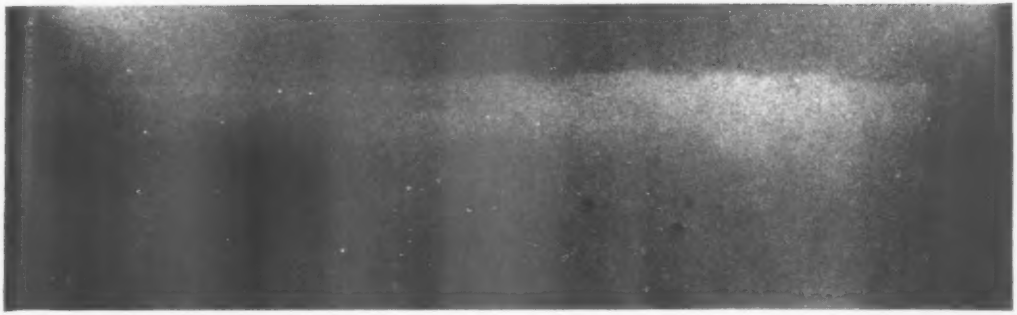


FIG. 11.—*Radiograph of a typical butt-weld made with the new rod in 1-in. thick s.-g. iron plate,* (× 1).

ferritizing heat-treatment. The new rod will thus meet requirements for the joining of s.-g. irons, where it is of primary importance that welds shall have composition, mechanical and chemical properties similar to those of the parent iron. Steps are being taken for industrial trials of the new welding-rods, both in fabrications incorporating castings and in the reclamation of defective castings.

Reclamation of Defective Castings

The latter operation is receiving increasing attention by foundries who are required to meet stringent requirements of quality and properties in their products. It has been found that the position of defects in castings causes difficulty in welding, and several trials have been made with the new rod to evolve a procedure which will consistently give weld metal free from porosity and dross. Surface cleanliness of the rods is important, and the best welds were obtained by using a minimum amount of flux, and a soft, neutral welding flame. Further, it has been found beneficial to enlarge the defective zone of the casting by grinding, to remove unsound metal and improve access to the area for the welding operation. Similar conditions have been described in connection with the welding of cast iron by the oxy-acetylene process[12]. The radiograph of a typical butt-weld made with the new rod, reproduced in Fig. 11, shows the satisfactory level of soundness obtained in the present work.

Acknowledgment

The authors are indebted to Mond Nickel Company, Limited, for permission to publish this report. In addition, they acknowledge the assistance given by their colleague, Mr. D. J. Heath, in the laboratory welding trials, and by Birmidal Developments, Limited, in field trials.

REFERENCES

[1] Mond Nickel Company, Limited (International Nickel Co., Inc.), "Improvements relating to Cast Iron" Brit. Pat. 630,070, 1949 (appl, 1947).

[2] Everest, A. B., "The Engineering Properties and Applications of Spheroidal-graphite Cast Iron." Paper to 4th International Mechanical Engineering Congress, Stockholm, June, 1952; extended abstract in *Engineer*, 1952, **193,** 794 to 795 and 838 to 840, reprinted as Mond Nickel Co. Publn. No. 603. July, 1952.

[3] Ball, F. A., and Thorneycroft, D. R., "Metallic-arc welding of Spheroidal-graphite Cast Iron." *Proc.* Inst. Brit. Foundrymen, 1954, **47,** A118 to A133, disc., A133 to A136.

[4] Kinkgren, T. E., and Waugh, H. C., "Joining of Ductile-iron by several Arc-welding Methods," *Welding Jnl.*, 1953, **32,** 947 to 956.

[5] Hütter, L., and Neumann, H., "Electric Butt-welding of Gray Castings," *Giesserei*, 1955, **42,** 605 to 609.

[6] Private communication from A.B. Akers Styckebruk, Sweden.

[7] Riley, R. V., and Dodd, J., "Ferrous Rod for welding Nodular-graphite Cast Iron," FOUNDRY TRADE JOURNAL, 1952, **93,** 555 to 560.

[8] Day, R. O., Snyder, J. S., and Inskeep, H. B., "A New Nodular Cast-iron Welding-rod for Foundries and Fabricators," *Welding Jnl.*, 1957, **36,** 410s to 414s.

[9] Brit. Pat. Provisional Specification No. 8893/59.

[10] Carr, A. L., and Steven, W., "Impact Properties of Annealed S.-g. Cast Iron," paper No. MO-3 to International Foundry Congress, Paris, September, 1953; *Metal Treatment*, 1953, **20,** 455 to 461; *Fonderie*, 1954, No. 99, 3883 to 3896, disc., 3896.

[11] Eckel, E. J., "A Study of the Ferritization of Nodular Iron," *Trans.*, Amer. Foundrymen's Soc., 1958, **66,** 151 to 165.

[12] "Manutention." "Avoidance of Blowholes in welding Cast Iron," FOUNDRY TRADE JOURNAL, 1953, **94,** 245 to 246.

Machine-tool Orders

Machine-tool orders in February confirmed the sharp rise in demand taking place this year, according to figures issued by the Machine Tool Trades Association. About £13,000,000 of new orders were booked—more than twice as much as a year ago. Home orders more than doubled those of February, 1959, and export orders were nearly three times higher. Deliveries exceeded the January rate by 9 per cent. and were 36 per cent. higher than in February, 1959. Export deliveries were 27 per cent. more than in January and 55 per cent. over those for February last year.

Total deliveries, amounting to just under £7,800,000, were well below the rate of new orders, and as a result the outstanding order-book rose to £64,000,000, an increase of more than £5,000,000 over January, and £8,000,000 more than the end of last year.

OEEC Non-ferrous Output

Production and consumption of non-ferrous metals in countries affiliated to the Organization for European Economic Co-operation have reached a new peak since the beginning of 1959, according to a survey by the OEEC Non-ferrous Metals Committee.

Consumption rose even more than production. There was expansion in aluminium and nickel throughout 1959, but copper, lead, and zinc showed an increase in the last quarter of 1959 only. The increased consumption of lead was more than expected. Tin consumption remained stable.

Imports into Europe increased during 1959 and will remain high for the first half of 1960, the survey disclosed. Imports from Eastern countries were constant for aluminium but lower for zinc than in 1957 and 1958. Zinc imports into the United Kingdom, however, are higher than in 1959.

Company News

BIRFIELD, LIMITED, general engineering suppliers, of London, W.1—Interim dividend for the year ending July 31, 1960, is to be increased from 7½ per cent. to 10 per cent.

WORTHINGTON-SIMPSON, LIMITED, manufacturers of pumps and pumping machinery, of Newark (Notts)—The final dividend of 12½ per cent. makes 20 (17½) per cent. for 1959.

NEW BROKEN HILL CONSOLIDATED, LIMITED—The final dividend of 30 (16¾) per cent. makes 45 (26¾) per cent., tax free for 1959. Net profit increased from £476,317 to £796,238.

BAKER PERKINS, LIMITED—Rowsons (Conveyors), Limited, engineers specialising in mechanical-handling equipment, is to be absorbed into the group. The deal involves about £100,000.

WILMOT-BREEDEN (HOLDINGS), LIMITED, vehicle accessory makers, etc., of Birmingham—Final dividend is raised by 1 per cent. to 9 per cent., making, with the higher 6 (5) per cent. interim, a total of 15 (13) per cent. for 1959.

CONSOLIDATED ZINC CORPORATION, LIMITED—Net profit was £2,663,267 (£1,617,876), after tax of £1,209,815 (£1,069,003). The dividend is raised from 3s. to 4s. per £1 ordinary share with a final payment of 2s. 9d. per share.

HEENAN GROUP, LIMITED—A one-for-two scrip issue is proposed. A final dividend for the year ending September 3, 1960, of 8 per cent. is foreshadowed on the increased ordinary capital which makes the equivalent of 17 (15) per cent. on the existing capital.

GLOVER & MAIN, LIMITED, engineers and domestic appliance makers of London, S.W.1.—Final dividend of 9d. makes 11d. per 10s. share for 1959, on capital increased by a one-for-two scrip issue, against the previous year's effective equivalent of 10.66d.

C. & W. WALKER, LIMITED, gasworks engineers, ironfounders, etc., of Donnington (Salop)—The dividend for the year to January 31, 1960, is 24 per cent. on capital increased by a one-for-two scrip issue (equivalent to 23½ per cent.). Group net profit was £47,803 (£49,189).

HOPKINSONS, LIMITED, engineers and bronze, iron, and steel founders, of Huddersfield—Mr. R. L. Brown, chairman, reports that the volume of orders received in 1959-60 was maintained at the previous year's level, but sales have shown an increase of 7 per cent. on the previous year.

SOUTH CROFTY, LIMITED, producers of tin, wolfram, and arsenic, of Redruth (Cornwall)—Group net profit for 1959 was £31,478 (loss £50,842). It is stated that with a tin price maintenance, and improvements in hand or intended, for cutting costs, a further step towards wiping out the deficit is possible.

HARLAND ENGINEERING COMPANY, LIMITED—Group net profit was £171,221 (£100,264), after tax of £152,414 (£129,258). The final dividend of 12 per cent. makes 16 per cent. for 1959 on an ordinary capital increased to £600,000 by a one-for-two scrip issue, against a previous equivalent of 9½ per cent.

QUALCAST, LIMITED—"Never have we reached such output figures or paid such a large wage bill, and our productive capacity is being strained to the utmost," states the chairman, Mr. V. Jobson. After nine months of its current financial year the company is within 1 per cent. of its increased budget for the year.

CLIFFORD MOTOR COMPONENTS, LIMITED—An agreement has been entered into to purchase all the issued share capital of North Bridge Engineering, Limited, for £250,000. All the North Bridge shares were held by its chairman, Mr. W. Frisby and his family. He has sold his interests solely that a 75 per cent. extension can be carried out to meet export demands.

ASSOCIATED ENGINEERING, LIMITED, of Leamington Spa—Group net profit, after all charges except tax, for the six months to March 31, 1960, is estimated at £1,963,000 (£1,148,000). Interim dividend of 5 per cent., less tax, is declared. All companies in the group are working to capacity and net profit for the year should materially exceed last year's level, it is stated.

GASKELL & CHAMBERS, LIMITED, brassfounders, pewterers, bar and cellarage engineers, of Birmingham—A final dividend of 20 per cent. making 25 per cent. plus a capital distribution of 2½ per cent. is announced for 1959 all on the capital increased by a one-for-two scrip issue (against 35 per cent. plus a capital distribution of 5 per cent. for 1958 on the smaller capital).

UNION STEEL CORPORATION (OF SOUTH AFRICA), LIMITED—Before tax of £373,437 (£479,312), group profit for 1959 was £1,371,011 (£1,550,965). The dividend is 15 per cent. on capital increased by scrip issues to preference holders and by a 100 per cent. scrip issue to ordinary (7½ per cent. equivalent), and 15 per cent. on A and B 8 per cent. participating preference (same).

£1,000,000 Expansion Programme for Bamford (Excavators)

Expansion programme costing £1,000,000 is to be undertaken by J. C. Bamford (Excavators), Limited, Rochester (Staffs), which claims to be makers of the first hydraulic loaders in Europe. The programme will be spread over the next three years and will provide facilities for increased production, research, and for the development and testing of new products.

Backed by increased factory space and facilities the production of machines is expected to be far in excess of the present rate of 1,500 a year. As soon as possible work is to be started on a new range of earthmoving equipment to supplement the existing range. This year a record sales figure of £4,000,000 is hoped for, compared with £2,500,000 last year and £1,200,000 in 1958. Between 30 and 40 per cent. of the machines produced are exported, mainly to European countries, and the overseas sales and service organization is to be strengthened and made world-wide.

Skefko pays Jubilee Bonus

Final dividend of 7½ per cent. is recommended by the board of the Skefko Ball Bearing Company, Limited, making a total of 10 per cent. for the year. A special jubilee bonus of 1½ per cent. is also recommended and this, together with the final dividend, will be paid on the present capital, increased from £4,500,000 to £6,000,000 last November.

The jubilee will also be marked by the setting aside of more than £100,000 for the benefit of employees. Most of this will be used to augment payments during absence through sickness.

The chairman, Sir Victor Mallet, said that the substantial sums spent on expansion and improvements had been thoroughly justified. "However," he went on, "in order to cope with the ever-growing demands and to maintain maximum efficiency, we shall be obliged to continue spending further sums of money on our plant and manufacturing facilities."

Failure of Employers to Adopt Usual Precautions—Is this Negligence?

By "Barrister-at-Law"

Does the failure of an employer to adopt the common precautions which it is the practice of other employers to adopt for the safety of their workmen, constitute negligence in law? This important question was the subject of a decision of importance to founders which was recently given by the House of Lords in the case Brown *vs.* Rolls Royce, Limited.

Material Facts

The material facts of this case were as follows: From 1952 to 1955, Brown was employed as a machine oiler, and owing to the nature of his work, his hands were constantly in contact with oil. It was customary for other employers to supply their men doing such work as would bring them into contact with oil with barrier-cream, this being a precaution against their contracting dermatitis. Medical opinion was divided as to the value of barrier-cream as a preventive of dermatitis as the result of contact with oil. Prior to 1940, the company had supplied barrier-cream to their employees, but when a new medical adviser came on the scene, they ceased to do so. It was a significant fact that despite the withholding of the barrier-cream, dermatitis cases among the firm's employees had fallen from 353 in 1941, to three or four in 1957. That fact had accordingly supplied strong evidence that barrier-cream had not the efficacy that was generally thought. The opinion of the company's new medical adviser, when he joined the firm in 1940, was not favourable to the continuance of the supply of barrier-cream. The company relied completely on the advice given them by their new medical adviser as to the precautions to be taken against dermatitis. They followed his instructions, and ceased to supply barrier-cream as one of their precautions. Their medical adviser was held to have exercised proper care and skill in the advice he had given and not to have been at fault in giving that advice, which included of course, the cessation of further supplies of barrier-cream. At the same time, it was the common practice of other employers to supply their men doing similar work with barrier-cream.

Brown who had unfortunately contracted dermatitis, brought an action for negligence against the company, his employers, and he alleged as a ground of negligence, failure on the part of his employers to supply him with barrier-cream. The question accordingly arose as to whether on these facts, he had established to the satisfaction of the Court, that his employers had been guilty of negligence.

Onus of Proof

Now when a person alleges that someone else has been negligent, and that he has suffered injury or damage in consequence, the burden of proving the negligence is placed by the law fairly and squarely on the shoulders of the person making the allegation. That is the *legal* onus of proof which is placed on him. That onus must from first to last be discharged. Where however, evidence is given such as to raise a sufficient presumption of negligence on the part of the employer, it is then for the employer to rebut that presumption by other evidence.

In the above case, the fact that the employers had not followed the common practice of supplying barrier-cream, was sufficient to raise a presumption—but only a presumption—from which negligence *might* be inferred on their part. It was for the employers to displace that presumption, if they could, and (as it were) to pass the "ball" back into the court of their employee, who was alleging the negligence.

This the employers were held to have done successfully. For they had established not only that there were strong differences of opinion among the medical profession as to the efficacy of barrier-cream, but also that they had followed the precautions advised by their own medical adviser, who, it had been established, had exercised proper care and skill in advising them. Moreover, there was no evidence before the Court as to what other precautions against dermatitis the other employers, who supplied barrier-cream, themselves took.

The employee accordingly was held, on the facts and in the circumstances of the case, to have failed in establishing negligence on the part of his employers.

Conclusion

One important general aspect of this case should be carefully noted. It is this: Failure on the part of an employer to follow a common practice, though it may be a weighty circumstance to be considered in determining whether failure to comply with that practice constituted negligence, is not necessarily conclusive of negligence on the part of the employer.

Industrial Output still rising

After the two point rise in production in January, the seasonally adjusted index was unchanged in February at 119 (1954=100). The provisional estimate for March is 119-120. During the first quarter of 1960, the average was 2 per cent. above the last quarter of last year and 11 per cent. higher than the first quarter of last year.

The reduction in the rate of increase is believed to be more as a result of delivery delays and bottlenecks rather than a lessening in demand. Another possible factor is the tendency for engineering prices to rise after the introduction of the 42-hour week.

Dinner

IRON & STEEL INSTITUTE

The annual dinner of the Iron and Steel Institute was held on Wednesday, May 4, at Grosvenor House, Park Lane, London. Some 1,500 members and guests were present and even though the largest dining hall in London had been reserved for the occasion, over 200 people had to be turned away. After the Loyal Toast, the toast of "Iron and Steel Institute and Industry" was proposed by the Rt. Hon. Richard Wood, P.C., M.P. (HM Minister of Power) and Mr. W. F. Cartwright, D.L., J.P. (president of the Institute, and assistant managing director and general manager of the Steel Company of Wales, Limited) replied. Mr. I. F. L. Elliot (hon. vice-president of the Institute) proposed "The Guests" and Sir Cyril Musgrave, K.C.B. (chairman, Iron and Steel Board) made suitable reply.

Mr. Cartwright, chairman at the dinner, was accompanied at the top table also by Professor H. O'Neill (vice-president, Institute of Metals); Professor A. Lefebvre (*Soc.Roy.Belge des Ingenieurs et des Industriels*); Dr. G. Odone (member of Council, *Associazione Italiana di Metallurgia*); Dr. F. A. Springorum (director, Mannesmann AG, Germany); Mr. E. C. Lysaght (chairman, John Lysaght, Limited); Mr. G. L. Bailey, C.B.E. (director, British Non-Ferrous Metals Research Association); Professor P. M. Coheur (director, *National de Recherches Metallurgiques*, Belgium); Dr. L. B. Pfeil, O.B.E., F.R.S. (member of Council); Mr. D. F. Campbell (hon. vice-president); Mr. E. W. Senior, C.M.G. (commercial director, British Iron and Steel Federation); Mr. K. W. C. Grand (member, British Transport Commission); Dr. C. Sykes, C.B.E., F.R.S. (chairman of Council, British Iron and Steel Research Association); Dr. Ing. A. Michel (director, August-Thyssen Hutte AG, Germany); Mr. W. E. Lambourn, M.B.E. (joint deputy managing director, Pressed Steel Company, Limited); Sir F. Scopes (chairman, Stanton Ironworks Company, Limited); Dr. Ing. A. Vivaldi (director, Ilva, Genoa); Mr. J. Mitchell, C.B.E. (past-president); Dr. H. P. Weitzer (managing director, Vereinigte Oesterreichishe Eisen und Stahlwerke AG); Sir G. C. R. Elev, C.B.E. (chairman, Richard Thomas & Baldwins, Limited); Dr. H. Biers (hon. member); Mr. A. Desoer (joint managing director, S. A. Cockerill-Ougree, Belgium); Mr. C. R. Wheeler, C.B.E. (past-president, and president, British Cast Iron Research Association); Mr. A. Reynaud (president, Soc. Lorraine de Luneville); Sir C. Bruce-Gardner, BT. (president, British Iron and Steel Research Association); Dr. E. L. Dupuy (hon. vice-president); Mr. H. Peake (chairman, Steel Company of Wales, Limited); Sir H. Jephcott (chairman, Research Council, Department of Scientific and Industrial Research); Sir C. Musgrave, K.C.B. (chairman, Iron and Steel Board); Mr. P. van Delden (managing director, Royal Netherlands Blast-Furnace and Steelworks, Limited); Sir A. McCance, F.R.S. (chairman, Colvilles, Limited), and the Rt. Hon. R. Wood, P.C., M.P. (HM Minister of Power); Lord Brecon, J.P. (HM Minister of State for Welsh Affairs); Viscount Knollys, G.C.M.G., M.B.E., D.F.C. (chairman, English Steel Corporation Limited); Mr. A. H. Ingen-Housz (past-president); Sir J. Pode (hon. treasurer); Director-General M. Marchesi (managing director, Finsider, Italy); Sir R. Morrison, Q.C. (independent chairman, British Iron and Steel Federation); Viscount Ridley, C.B.E., D.C.L. (chairman, Consett Iron Company, Limited); Dr. Mary L. Cartwright, F.R.S. (mistress, Girton College, Cambridge); Hon. R. G. Lyttelton (past-president); Prof. Dr. H. Schenck (president, Verein Deutscher Eisenhüttenleute); Mr. W. Barr, O.B.E. (past-president); Dr. R. F. Mehl (European technical consultant, United States Steel Corporation); Mr. R. Summers (president, British Iron and Steel Federation); Dr. H. Cammann (deputy to ambassador, European Coal and Steel Community); Captain H. Leighton Davies, C.B.E. (past-president); Sir D. Proctor, K.C.B. (Permanent Secretary, Ministry of Power); Mr. D. Taccone (director, iron and steel division, FIAT, Italy); Sir R. Shone, C.B.E. (Iron and Steel Board); Dr. Ing. H. Cramer (director, Hüttenwerke Siegerland AG, Germany); Mr. R. Mather (past-president); Dr. Ing. A. Wimmer (director, Hoesch Walzwerke AG, Hohenlimburg Germany); Colonel J. M. Bevan, M.C., D.L., J.P. (chairman, Briton Ferry Steel Company, Limited); Dr. Ing. H. Brandi (director, Phoenix-Rheinrohr AG, Germany); Sir C. Goodeve, O.B.E., F.R.S. (director, British Iron and Steel Research Association); Sir W. Jackson, D.S.C., F.R.S. (president, Institution of Electrical Engineers); Sir J. Duncanson (honorary vice-president); Dr. J. H. Watson, C.B.E., M.C. (president, Institute of Mining and Metallurgy); Sir L. Evans, C.B.E. (deputy chairman, Iron and Steel Board); Prof. A. J. Murphy (president, Institution of Metallurgists); Mr. J. Pomey (past-president, *Soc. Française de Metallurgie*) and Mr. R. C. Chirnside (president, Society for Analytical Chemistry).

Scrap Metal Accident

A fatal accident caused by a piece of scrap metal projecting 70 ft. and hitting a rigger is reported in a RoSPA *Bulletin*. At the works where the accident happened, scrap-steel ladle skulls were being broken in a pit by means of a drop-ball weighing approximately 10 tons, this being released from a height of about 40 ft. It was thought that adequate precautions had been taken when personnel were prevented from approaching within 70 ft. of the pit, but a piece of metal flew out during the breaking operation and hit the rigger at that distance and killed him. From subsequent investigations it was learnt that heavy pieces of metal have been found over 100 ft. away.

The RoSPA *Bulletin* comments that although it may be unusual for scrap to fly this distance, it seems clear that the only way to ensure safety is for all personnel to be removed from the area during breaking operations, or for adequate shelter to be provided.

Local Employment Act, 1960

The Local Employment Act, 1960, which came into operation on April 1, is now the major law on the Statute Book dealing with unemployment, since it repeals the Distribution of Industry Acts, 1945-58.

It is in part a consolidation of existing legislation, but it also provides for some increased powers and simplifies administration. The accent is on flexibility and the old development areas are replaced by a single list of development districts. The list covers districts where high unemployment exists and also where it is threatened and is likely to persist (whether seasonally or generally); it may be altered at any time by the Board of Trade without reference to Parliament.

The inducements which may be made available under Part I of the Act to persons carrying on or proposing to carry on undertakings in development districts are building grants, loans or grants, and payment towards the cost of the removal and resettlement of key workers and their dependants.

Applications for financial assistance under Sections 3 and 4 should be made direct to the Secretary, Board of Trade Advisory Committee, Romney House, Marsham Street, London, S.W.1. A pamphlet will be issued shortly by the Board of Trade explaining how to apply and specify the information required.

Association of Bronze & Brass Founders

Report of the Chairman of the Technical Committee

When Mr. R. Lancaster, chairman of the Technical Committee of the Association of Bronze & Brass Founders, presented his report at the annual general meeting of the Association in London at the end of last month, he explained that the year had been a busy one and the Association's liaison with other bodies had resulted in considerable extra work. He dealt in turn with the constitution of the Committee; the revision of B.S.1400 and the re-issue of an explanatory booklet for it; inspection procedure; relations with the Institute of British Foundrymen and the British Non-Ferrous Metals Research Association, and education generally.

Introducing his report at the annual general meeting* of the Association of Bronze & Brass Founders held in the Connaught Rooms, London, on April 27, the chairman of the Technical Committee, Mr. R. Lancaster, dealt in turn with a wide cross-section of the Association's affairs. An extract from his report is printed in what follows.

During the past year, the Committee had lost the services of Mr. A. R. French, of J. Stone & Company (Charlton), Limited, who had done so much work for the Committee, of Mr. Blandford of Dewrance & Company, Limited, and of Mr. Morgan of Westinghouse Brake & Signal Company, Limited. He had been pleased to welcome to the Committee, Mr. R. W. Eade of J. Stone & Company, in place of Mr. French, also Mr. Wallace who had been able to rejoin as representative for Dewrance & Company. He was happy to report the welcome return of Mr. Frank Hudson who had left the Committee some time ago owing to pressure of work. He said he was particularly anxious to keep up the strength of the Committee in order to maintain its efficiency and have representatives available to serve on the committees of other organisations without overburdening any member of the Committee. Nominations to the Committee would be welcome from any member of the Association who had someone on their staff suitably qualified.

B.S.1400

Since the draft of the revised B.S.1400 had been issued a year ago for comment, the matter had largely been in abeyance whilst the British Standards Institution had sifted and classified the numerous comments received. Many of these dealt with the supposed effect on the cost of ingot of the revisions proposed. The Association, however, believed that what was proposed was only putting into writing present good standard practice.

The Committee had had a meeting with representatives of the Ingot Manufacturers' Association during the year at which some agreement had been reached on the more popular alloys. A meeting of the BSI Committee had been held in February at which, after general consideration of the matter, the Committee had proceeded to deal with consideration of the alloys individually and considerable progress had been made by the reasonable solution of maintaining the high standard of high-grade alloys and leaving others virtually unchanged. (Actually, re-drafting had progressed as far as leaded gunmetals). It was hoped that the revised standard would be agreed and adopted fairly soon.

Companion Volume

The Companion Volume to be issued by the Association would have to be edited and brought into line with the new BS1400, and until this Standard was adopted the book could not be completed or published. Publication, however, would be arranged at the same time as the new standard. It was hoped that the Companion Volume would help to increase the use of members' castings by making available information on the qualities required in castings for different uses, the properties and special applications of the various alloys and similar information to ensure that, as far as possible, castings ordered would be fit for their purpose and give every satisfaction in use.

Code of Inspection Procedure

The Code of Inspection Procedure which had been in use and had given every satisfaction for more than five years, had been reviewed with the Ministry of Supply Inspectors in October last with a view to printing a further edition. Complete agreement had been reached with the Inspectors on the revisions before the Ministry of Supply became the Ministry of Aviation. This change meant that the matter was in abeyance and it was not known how inspection arrangements would be affected by it, if at all. There was every reason to expect that the friendly relations between the Committee and the Inspectors would continue. In the meantime, it was understood that the Code of Inspection Procedure would remain in force. More information should be available at the end of May.

Institute of British Foundrymen

Arrangements which had been made for closer liaison with the Institute of British Foundrymen

* The general report on the ABBF Meeting was printed in last week's JOURNAL

could only have good results for both organisations. The chairman of the ABBF Technical Committee had been co-opted to the IBF main technical committee, and the ABBF now had representatives serving on six IBF committees. New ones were being formed and no doubt ABBF representation would be arranged where appropriate. Mr. Lancaster said he was particularly anxious that their representation should be adequate and fruitful and this was one of the reasons why he wished to see the Technical Committee enlarged and strengthened.

British Non-Ferrous Metals Research Association

Through the Technical Advisory and Research Group Liaison Committee as well as representation on many of the research committees of the British Non-Ferrous Metals Research Association, the Technical Committee was in very close touch with the work being done by the Research Association. That Association was doing a great deal of work for the copper-alloy foundry industry which should perhaps be better known.

Members were no doubt aware of the important developments in gunmetals resulting from the Research Association's work which offered to the foundry industry a greatly improved material, enabling them to supply better quality castings and thus give greater satisfaction to users. Considerable work was also being done on the effect of impurities on gunmetals, together with test-bar design, and running and gating. This was all specialised work for the foundries and was quite apart from the general work, such as rapid methods for analysis and work connected with the Clean Air Act. He urged members to support the research group as in this way they would not only support the research work being done but have at their disposal the other services of the Research Association.

Education

The Technical Committee was most concerned about the supply of skilled labour in the industry in the future, and was anxious that there should be courses available for the young foundry workers who would be the craftsmen of the future. In many centres such courses were not available and it was essential that they should be provided. Where they were available, foundry managements should do all they could to encourage their apprentices to attend the courses. The Committee had been very interested in the short courses made available in America, through the American Foundrymen's Society, for technicians and similar personnel, and thought that this activity could with advantage be copied in this country.

International Standards

Standards for copper-base alloys were being discussed by one of the committees of the International Standards Organisation. As previously reported, basic compositions had been agreed for a number of alloys and very recently the Committee had been discussing mechanical properties and impurity limits. It was understood that mechanical properties would be largely in line with those proposed for the British Standard, and as regards impurities, these had still to be discussed. The Committee was pleased that one of the United Kingdom representatives was Mr. E. C. Mantle, of the British Non-Ferrous Metals Research Association, who was closely associated with the ABBF Technical Committee.

Thanks to Members of the Committee

In closing his report, Mr. Lancaster said he would like to thank his colleagues on the Technical Committee for the great deal of work they had done on behalf of members of the Association, and for the excellent support they had given him on all occasions. He also thanked Mr. French for the immense amount of work which he had done on technical matters, particularly in connection with the BS1400 revision, and as the Committee's representative on the International Standards Committee. He then added his good wishes to those of members for Mr. French's success in his new sphere of work. Finally, he acknowledged the work of the secretaries, mentioning in particular Mr. Rogers. Their unfailing help and courtesy, he said, had relieved him of a great deal of work attached to the office of chairman of the Technical Committee.

CJB Scholarships

Constructors John Brown, Limited, have entered into an agreement with the Institution of Chemical Engineers for the award of two scholarships. Their purpose is to encourage research in chemical engineering and, in particular, in chemical-plant design. The scholarships are tenable at any educational institution in the United Kingdom in receipt of grants from the University Grants Committee, and having a department of chemical engineering under the direction of a professor of chemical engineerings.

Further particulars may be obtained from: Dr. J. B. Brennan, general secretary, Institution of Chemical Engineers, 16, Belgrave Square, London, S.W.1. Applications should reach the Institution not later than June 1, 1960.

Centenary Plaque on New Office Block

Plaque to commemorate a century's association of Stewarts and Lloyds, Limited, with the city of Birmingham was unveiled last week by the Lord Mayor, Ald. John Lewis, in the entrance hall of the 11-storey £1,000,000 office block being built for the company. The building will be completed in September next year.

It will include an internal car park and the 177-ft. high roof will be specially stressed with a view to its possible future use as a landing ground for helicopters. The block is of reinforced concrete and will accommodate a staff of 700 now housed in various parts of the city.

Mr. J. BELL has been made a director of the M.O. Valve Company, Limited, a subsidiary of the General Electric Company, Limited.

Notes from the Branches

Tees-side

Entries for the 7th apprentice competition of the Tees-side branch of the IBF (160), were slightly down on the previous two years but the standard of entries was much higher, particularly in the patternmaking section. Prizes were presented by Mr. John Vickers, at Head Wrightson's, Teesdale Hall, Thornaby-on-Tees, on Friday, April 8. Entries in the practical sections had been judged at the Darlington Forge Limited, Darlington, as follows:

Section.	*Judges.*
Steel moulding ..	Mr. R. Horton, Samuel Osborn & Company, Limited.
	Mr. R. Wright, English Steel Castings Corporation, Limited.
Iron moulding ..	Mr. D. T. Kershaw, Modern Foundries, Limited.
Non-ferrous moulding	Mr. C. A. Timms, British Engines, Limited.
Wood and metal patternmaking	Mr. L. Brown, Premo Patternmaking Company, Limited.

The Apprentice Competition Committee decided to increase the written-paper section to cover junior foundrymen between the ages of 21 and 28 years. Though entries were small, the standard of four of the entries was very good. This section was judged by Mr. J. Bamford, head of the National Foundry College. Mr. J. Currie (of Blackett, Hutton) judged the written-paper section (under 21) and remarked that the entries, though fewer in number this year, were of a much higher quality than previously, showing more originality and detail.

PRIZES AWARDED.

		£	s.	d.
Wood Patternmaking (36 entries)				
(1) I. R. Lowther ..	Northgate Patternmaking Co. Ltd.	5	5	0
(2) B. Brady ..	Darlington Forge Ltd.	3	3	0
(3) R. Harrison ..	John Vickers & Sons Ltd.	1	1	0
Metal Patternmaking (six entries)				
(1) R. Barton ..	John Vickers & Sons Ltd.	5	5	0
(2) R. Sadler ..	John Vickers & Sons Ltd.	3	3	0
Steel Moulding (49 entries)				
(1) G. Postgate ..	Blackett Hutton & Co. Ltd. ..	5	5	0
(2) F. Peacock ..	Head Wrightson Ltd.	3	3	0
(3) D. Hawkins ..	Head Wrightson Ltd.	1	1	0
Cast Iron (41 entries)				
(1) J. Wright ..	Darlington Railway Plant & Fdry. Co. Ltd.	5	5	0
(2) E. Morgan ..	Geo. Brown & Bros. Ltd.	3	3	0
(3) R. Fawcett ..	Stockton Castings Co. Ltd. ..	1	1	0
Non-ferrous (five entries)				
(1) J. Mulley ..	John Vickers & Sons Ltd. ..	5	5	0
Written Paper Section (Under 21) (17 entries)				
(1) B. Bird ..	Blackett Hutton & Co. Ltd.	5	5	0
(2) T. Eyeington	Ashmore, Benson Pease & Co. ..	3	3	0
(3) C. Fowell ..	Cochranes (Middlesbro') Fdry. Ltd. ..	1	1	0
Written Paper Section (21–28) (six entries)				
(1) G. Littler ..	Davy and United Eng. Co. Ltd. ..	5	5	0
(2) J. Long ..	Wm. Shaw & Co. Ltd.	3	3	0
(3) C. Watson ..	Cochranes Ltd.	1	1	0

The Apprentice Competition Committee comprised the following: Mr. A. P. Riley, chairman; Mr. D. Forster, secretary; and Mr. T. Hurst, all of Darlington Forge Limited; Mr. G. Taylor, Head Wrightson Limited; Mr. G. Stanley, Cochranes (Middlesbro') Foundry, Limited; Mr. T. Wolverson, Stockton Castings Limited.

London

The annual general meeting of the London branch was held at the Constitutional Club, Northumberland Avenue, London, W.C.2. For the 1960/61 session, Mr. D. A. C. Hutchison was elected president, and Mr. A. R. Parkes and Mr. J. R. Booth as senior and junior vice-presidents respectively. Mr. Parkes was re-elected honorary secretary also for the coming session, with Mr. T. Wills as assistant secretary. As members of branch Council, Mr. L. A. S. Harbourne and Mr. J. P. Ellis were re-elected from those retiring from office this year.

Following the annual general meeting, there was an ordinary general meeting at which the lecturer was Mr. J. P. Graham (of British Coke Research Association), supported in the discussion by Mr. L. W. Bolton

Photographs taken during the annual apprentices' competition organized by the Tees-side branch of the Institute and held at Darlington Forge, Limited. In the left-hand picture, Mr. L. Brown (Birmingham) is seen examining an entry in the wooden patternmaking section with Mr. T. Hurst (Darlington Forge, Limited), a member of the competition committee. (Right) The officials shown appraising entries in the steel section are (left to right) Mr. R. Horton (Sheffield), one of the judges; Mr. R. Wright (Sheffield), also a judge, and Mr. A. P. Riley and Mr. D. Forster (both of Darlington Forge), chairman and secretary respectively of the competition committee.

Notes from the Branches

(of Morris Motors, Limited). Mr. Graham's talk was entitled "Foundry Coke—Production and Utilisation" and he first considered the attempts which have been made to specify the desirable characteristics of foundry coke and went on to describe some of the work carried out to determine the influence of the properties of foundry coke on the performance of a cupola. Reference was made to the production of foundry coke and the type of coals used; the importance of size and size-range of coke was stressed, and further attention was given to the question of specification with particular reference to that suggested in the report of sub-committee T.S.47 of the Technical Council of the Institute. Mr. Graham's lecture was illustrated by the showing of a film which depicted the production of coke generally.

Discussion

The discussion opened by a member asking the lecturer where the best coke for cupolas was made, to which Mr. Graham replied that if the query emanated from the Midlands (which represented "no man's land" from the transport point of view), there would nowadays be a preference for Durham coke, but if the specification quoted by the sub-committee was met, there would be little to choose between the various types offered in the UK. Answering a question on the "reactivity" of coke, by which was meant the capacity of the coke to melt iron and give a carbon pick-up, Mr. Bolton said that in the UK the reactivity of cokes depended on their ash content, but the cell-wall thickness of a coke might have some effect. Another member said was it true that with low-ash coke, greater reactivity accrued? Mr. Bolton explained that it had been proved that to give maximum tapping-temperature of metal from the cupola, there must be a high percentage of carbon-monoxide in the gases leaving the stack, *i.e.*, about 13 per cent. He then outlined the so-called reactivity tests which could be carried out in a laboratory, but explained that there seemed to be little correlation between these and the service obtained from coke in a cupola.

Another speaker said it was possible—though not always economic—to use high-ash cokes for cupola melting, even those with 25 per cent. or more of ash, provided the fuel to metal and limestone ratios were adjusted and positive blowing methods were available to ensure correct blast volume, despite the high burden density. On this point, Mr. Bolton agreed in principle, and added that with British cokes which were of high quality compared with those of most other countries, it was consistency that was most needed. Even in the UK, it was possible to buy coke which had only a 1 per cent. ash content, he added. He thought that founders would be prepared to pay a premium for consistent-size coke, but damage in transit could vitiate any screening carried out at the coke-ovens. Mr. Graham added that it would be possible to provide a coke-quality against a price scheme for founders as was done with blast-furnace coke, but there needed to be an agreement on methods of testing and sampling. He agreed that degradation occurred in the coke size both in transit and at the works, but with insistence on a shatter index going up, say, to 95 there should not be such a bad break-up. Other points raised in the discussion concerned the size of coke—it being recommended that founders should specify the size grading they wanted. At the conclusion of the meeting, Mr. P. V. Palmer proposed the vote of thanks to Mr. Graham for his lecture and also to Mr. Bolton for his amplification of discussion points, and Mr. D. Waters seconded.

Sheffield

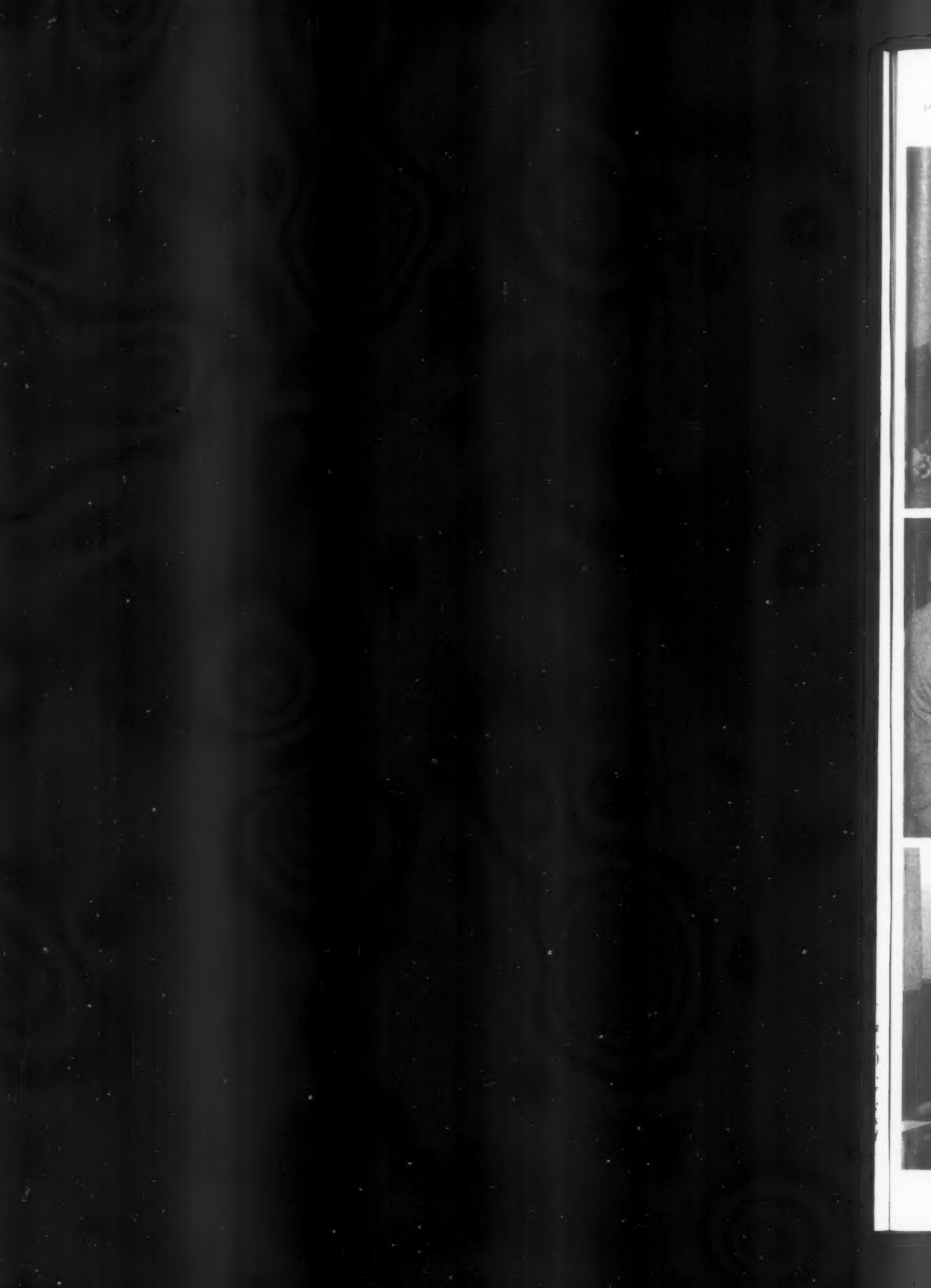
Results have now been announced of the Sheffield & District IBF Jubilee Apprentice Competition, the entries for which were assembled and judged at the works of Samuel Osborn & Company, Limited, Sheffield, on Saturday, April 30. One hundred and ninety-eight entries were received from 23 firms, some of them from as far afield as Gainsborough and Grimsby. The competition was open to all apprentices in the district and each section was divided into juniors 17 to 19 and seniors 19 to 21 years. The competition was essentially a practical one, and no written papers were set.

The judges, who kindly gave their services, came from outside the district and were Mr. Charsley and Mr. Stubbs (Stoke-on-Trent), Dr. Riley and Mr. Hurst (Darlington), Mr. Davies and Mr. Blyth (Trafford Park) and Mr. Brown (Birmingham). These gentle-

SUCCESSFUL COMPETITORS

	Apprentice.	Firm.
First	T. E. Johnson	Appleby-Frodingham
Second	M. J. Pope	John Fowler
Third	R. Adams	Newton Chambers
Junior Patternmaking.		
First	D. Croft	Laycock Engineering.
Second	I. S. Chapman	Darwins, Ltd.
Third	K. Williams	E.S.C.
Senior Light-alloy.		
First	J. Spooner	Newton Chambers
Second	B. Fletcher	Newton Chambers
Third	P. Taylor	Newton Chambers
Junior Light-alloy.		
First	M. Dalton	Newton Chambers
Second	E. Norman	Newton Chambers
Third	M. Bower	Newton Chambers
Senior Cast Iron.		
First	P. Freeman	Newton Chambers
Second	M. F. Peart	Marshall Sons (Gainsborough)
Third	M. Southern	Brightside Foundry
Junior Cast Iron.		
First	R. Parker	Newton Chambers
Second	K. Robinson	Renishaw Iron
	G. Harris	Renishaw Iron
Third	N. Gregory	Brightside Foundry
Senior Steel Castings.		
First	K. Oxley	Samuel Osborn
Second	R. Prigmore	David Brown
Third	B. Whittington	Firth-Vickers
Junior Steel Castings.		
First	J. Hesling	Edgar Allen
Second	W. G. Ward	David Brown
Third	G. Newbould	Darwins Ltd.

Illustrated on the facing page is "Judgement Day" of the IBF Sheffield branch apprentice competition when the entries were assessed by the panel of judges at the works of Samuel Osborn & Company, Limited. The upper photograph shows castings and patterns assembled for adjudication; below, (a) (from left to right) are Mr. Fox (William Jessop & Company, Limited), a patternmaking judge, Mr. H. Stubbs, a judge in the non-ferrous section, Mr. L. Brown (Premo Pattern Company, Limited), senior judge, patternmaking, and Mr. J. Richardson (Brightside Foundry & Engineering Company, Limited); in (b) Mr. Richardson is examining the competition poster and in (c) and (d) steel and non-ferrous castings respectively are being sorted out by Mr. J. H. Pearce (branch secretary) and Mr. Stubbs and Mr. G. H. Charsley (president, Stoke-on-Trent section).



a

ATTENDANCE
COMPETITION
b

c

d

Notes from the Branches

men were entertained to dinner on the previous evening by the organizing committee (chairman, Mr. E. Ayres; hon. secretary, Mr. R. Wright), and after the judging, together with the senior officials of the branch, they were entertained to lunch by the directors of Samuel Osborn & Company, Limited; at this function Mr. C. F. Hurst, deputy chairman of the company, presided.

Judges' Comments

The reports of the judges were as follow:—

Patternmaking.—The standard of entries was very high and when staged formed a most impressive exhibit.

Cast-iron Moulding.—The standard was generally good but it was unfortunate that a universal standard of cleaning had not been achieved and in future competitions it may be as well that entries could be shot-blasted before staging.

Steel Moulding.—The standard in both classes was excellent and the winning entries in both sections were exceptionally good.

Light-alloy Moulding.—Despite variation in alloy quality the winning entries were worthy efforts.

Non-ferrous Moulding.—This section was not well supported and it is felt that in future competitions many non-ferrous firms should give better support.

Presentation of prizes and certificates (to a total value of over £100) will take place at the first Autumn meeting of the Sheffield branch.

The branch Council express their indebtedness and thanks to the firms giving financial support; those offering facilities in the way of service, hospitality and employees' time; the Tees-Side branch for assistance and encouragement, and the individuals who have given so much of their voluntary time to make the effort worthy of the branch's Jubilee.

Slough Section

On April 12, the Slough section visited the works of International Alloys, Limited, Aylesbury, Bucks. The visitors were welcomed by Dr. E. Scheuer, who in a short address gave them a brief history of the company and an insight into its activities. The tour of the works was conducted by Mr. J. Wood (deputy chief metallurgist), Mr. M. G. Madge (chief inspector) and Mr. S. J. Williams (metallurgist) who is the Slough section president. The technical information that these gentlemen were able to impart added considerable interest to the tour.

Works

International Alloys, Limited, was founded in 1932 and is one of the world's largest producers of aluminium for foundry use. Production at Aylesbury includes ingots for foundry use, extrusion, rolling and forging billets and hardener alloys. Steel deoxidation alloys and magnesium anodes for corrosion protection, together with casting alloys are produced at the Minworth Works near Birmingham.

The visitors were shown the scrap yards, where the incoming metal is sorted and classified into the various alloys or alloy groups before melting, the identification of alloys being carried out where possible by spectroscope. This method enables determination of the standard alloy types in less than half a minute. During the tour of the scrap yards and sorting bays some members had very nostalgic memories of their war-time experiences when they saw the aircraft and aircraft engines being broken down.

Turnings are passed through a treatment comprising crushing, drying and magnetting. An automatic sampling device produces a representative sample of the treated material which is analysed and forms the basis for calculation of the furnace charge for alloying.

Recovery is the watchword at International Alloys. Not only is metal recovered from scrap but salt-fluxes and metal are recovered from the refining slag. The visitors were very interested in the plant for the recovery process, and they were assured that the recovered salt and metal, etc., compensates for the treatment cost.

Leaving the scrap behind, the parties then went into the foundries where the ingots are produced. The furnaces used for this work are oilfired-rotary type with capacities of 1,000 to 15,000 lb. Billet manufacture was next on the programme. The billet production unit comprises two semi-continuous casting machines fed with liquid metal from three reverberatory furnaces with capacities up to 28,000 lb. A group of 1,000 lb. crucible furnaces deals with special alloys. The continuous-casting machines simultaneously cast up to six billets in sticks about 8-ft. long. The liquid metal in a slow stream enters the water-cooled sleeve moulds through launders from 1,000 lb. lip tilted casting ladles. The billets are lowered at constant speed by means of a hydraulically-operated table, and the flow of the liquid metal at the top is controlled to keep the level of metal in the mould stationary.

Laboratories

After light refreshments in the works canteen the visitors were shown the laboratories. The physical laboratory and experimental foundry are equipped to carry out the various tests necessary for inspecting raw material and finished products, and to assist customers with any problems that may arise. Ultrasonic inspection is carried out for structural defects, mobile equipment being available for this purpose. One interesting item was a special die developed by the company for hot-spot shrinkage testing. It reproduces, under controlled conditions, typical shrinkage defects and permits the study of the influence of impurities and gas content on the tendency of the metal to develop shrinkage cavities of various types. The physical laboratory is also carrying out development work for improvements in the production processes and the examination of new processes and products.

From the physical laboratory the visitors went to the chemical laboratory, where Dr. W. Stross, the head of the department, took over and conducted the tour personally. This laboratory, whilst still using chemical methods of analysis has, for routine analysis, turned almost entirely to the use of the Quantometer. This is a direct-reading spectrograph which supplies accurate quantitative analysis figures for the ten normal elements in aluminium alloys within 2 to 3 minutes after the receipt of the sample. One could see that this machine was invaluable in making adjustments to the composition of the metal before the melt was cast.

Throughout the tour members could not help feeling that the emphasis at International Alloys was quality, and that correct specification was the prime factor. At the conclusion of the tour a very hearty vote of thanks to Dr. Scheuer, his fellow directors and colleagues, was proposed by Mr. D. E. Pitcher on behalf of the visitors. This was seconded by Mr. A. R. Parkes, who also thanked the guides for the expert way they had conducted the members throughout the afternoon. At 6 p.m. the visitors left the works after a most enjoyable and instructive afternoon, each with an attractive brochure presented to them before leaving.

East Anglian Section

The last meeting of the 1959/60 session of the East Anglian section was held on April 11, when the annual general meeting preceded a paper by Mr. H. G. C. King entitled "An Introduction to Patternmaking in Plastics."

The secretary, in his report of the section's activities during the past session, said that attendance was down on previous years, but certain meetings had been well attended. Expenses were in the region of £41 which compared favourably with previous years. In closing he said his year as secretary had been a happy one and he had enjoyed working for the president, Mr. T. D. Oughton.

The election of officers which followed was for the most part a formality since it had been agreed that Mr. T. D. Oughton should continue in office as president for a further year; the senior vice-president, Mr. B. R. Locke, was also re-elected. Mr. K. Bolton was elected junior vice-president and also re-elected as honorary secretary. A vacancy on the section Council was filled, Mr. R. F. Cornell being elected to serve for another three years.

After the business of the meeting was completed, Mr. King presented his paper on patternmaking in plastics, reported at various times in the JOURNAL (including October 29 and December 10, 1959, and March 3, 1960). Slides illustrated the lecture and plastic patterns were on exhibition.

Discussion

The ensuing discussion was opened by a member asking what degree of accuracy was obtained from plaster moulds. Using CO_2 moulds it was found that, due to the non-expansion of CO_2 sand, closer limits of tolerance were obtained on patterns produced. Mr. King replied that he found plaster cheap and easy to use, and here the limits of accuracy were governed by the drying time. He thought a better finish could be obtained by using plaster than by using sand, but, he said, if a sand mould fulfilled the requirements of the job, he could not see why it should not be used. Other points made by Mr. King in replies to questions were that by using dry moulds better stripping had been obtained; that plastic patterns stood up better to sand slinging than did metal patterns; they were also easier to repair or replace. To get a sharp profile on lettering (which sometimes became rounded in casting) if one pressed in each letter pattern with the thumb good results could be obtained. A notice plate was a good example. To a member who said he had noticed that the pattern on exhibition at the meeting did not conform to the standard colours, the machined faces not being shown, Mr. King explained that patterns can be dyed or cellulose painted to the required colours. The discussion closed with the author saying that patternmakers were keen to adopt the new techniques.

Mr. Whipp in proposing a vote of thanks to Mr. King, said that in the past patternmakers usually associated patterns with timber and patternmaking with woodwork, also they used to discuss the various types of wood used. Now other techniques had brought into being synthetic materials and Mr. King had, without doubt, shown in his paper how far he had gone in their application.

EMPLOYEES OF ROLLS-ROYCE, LIMITED, Derby, have started their own flying club. They have two test pilots and 20 ex-R.A.F. pilots in the membership. The club is negotiating for the use of an airfield near Derby and is raising funds to buy its first aircraft—a Tiger Moth.

British and World Shipbuilding

Lloyd's Register Returns for March Quarter

Steamships and motorships under construction at the end of March totalled 269 ships of 1,960,651 tons gross, being 71,949 tons less than the previous quarter and the lowest figure since June, 1950. The total comprises 93 ships of 630,217 tons fitting out afloat, and 176 of 1,330,434 tons still to be launched.

Vessels under construction included 51 steamships of 995,653 tons and 218 motorships of 964,998 tons. In other Commonwealth countries there were under construction 10 steamers of 141,680 tons and 35 motorships of 115,514 tons.

Oil tankers building in Great Britain and Northern Ireland totalled 55 ships of 990,226 tons, which is 3,430 tons more than in the December, 1959, quarter, and represents 50.5 per cent. of the total tonnage being built in this country. Total construction in hand in the principal districts is shown in Table 1.

TABLE 1.—*Shipbuilding Construction in Hand in Principal Districts of Great Britain and Northern Ireland.*

District.	March 31, 1960.		Dec. 31, 1959.		March 31, 1959.	
	No.	Gross tonnage.	No.	Gross tonnage.	No.	Gross tonnage.
Aberdeen ..	18	8,869	17	14,685	17	30,114
Barrow ..	3	92,500	3	92,500	2	67,500
Belfast ..	15	282,840	15	282,850	17	308,230
Bristol ..	3	2,250	3	4,544	2	4,850
Clyde:						
Glasgow ..	53	490,113	51	475,529	60	498,929
Greenock ..	22	157,196	22	164,519	24	164,296
Dundee ..	4	14,158	5	23,923	5	43,100
Hartlepool ..	2	22,600	3	31,690	4	28,200
Hull	34	13,891	37	14,564	38	15,176
Leith	10	46,634	9	42,134	10	44,319
Liverpool ..	8	113,963	11	123,547	12	111,678
Middlesbrough	8	134,610	9	137,172	13	197,986
Newcastle-upon-Tyne	33	362,299	31	369,634	40	457,464
Southampton	12	11,216	14	12,092	9	8,717
Sunderland ..	21	199,018	23	234,382	25	245,244

The sizes of steamships and motorships under construction in Great Britain and Northern Ireland included the following:—100 to 500 tons, steam nil (92 motorships); 500 to 1,000 tons, steam 3 (15); 1,000 to 2,000 tons, steam 4 (10); 2,000 to 4,000 tons, steam 3 (9); 4,000 to 6,000 tons, steam 1 (7); 6,000 to 8,000 tons, steam 1 (23); 8,000 to 10,000 tons, 2 (20); 10,000 to 15,000 tons, steam 8 (38); 15,000 to 20,000 tons, steam 2 (1); 20,000 to 25,000 tons, steam 7 (3); 25,000 to 30,000 tons, 6 (nil); 30,000 to 40,000 tons, steam 9 (nil); 40,000 tons and over, steam 5 (nil).

Apart from Communist countries there were under construction in the world 1,443 steamships and motorships of 9,366,974 tons gross, of which 20.9 per cent. is being built in Great Britain and Northern Ireland. The present total is 215,609 tons less than last quarter. Oil tankers under construction in the world amounted to 249 ships of 4,652,160 tons gross (124 steamships of 3,353,032 tons and 125 motorships of 1,299,128 tons), which is 218,709 tons less than the previous quarter and represents 49.7 per cent. of the total tonnage under construction in the world.

Of the steamships and motorships under construction throughout the world at the end of March, 5,213,816 tons (55.7 per cent.) are to be classed with Lloyd's Register. Of this total 1,929,258 tons, representing 98.4 per cent. of the tonnage being built, is at yards in Great Britain and Northern Ireland.

The death is reported of Mr. ROBERT SCOTT, who was managing director of the Atlas Steel Foundry & Engineering Company, Limited, Armadale.

Smoke, Grit and Dust

The Minister of Housing and Local Government, has made orders transferring to the local authorities concerned the control of smoke, grit and dust from certain industrial processes in Liverpool, Manchester and the Sheffield area, in place of control hitherto exercised by HM Alkali Inspectors.

The orders come into effect on May 23. They transfer control over smoke, grit and dust from certain power-stations and producer-gas plant to the Liverpool and Manchester city councils and a further order transfers to the Sheffield and District Clean Air Committee control over smoke, grit and dust from air and rotary furnaces for iron and steel, electricity works, producer-gas works, certain ceramic works and (in view of the constituent local authorities' long and close association with the steel industry) electric-arc furnaces up to 30 tons' capacity and tropenas converters. Among the processes the Minister has decided to exclude from the order are gas and coke works, blast-furnaces and open-hearth furnaces.

Applications made by six other local authorities (Reading and West Bromwich County Borough Councils and Jarrow, Luton, Redcar and Stalybridge Borough Councils) for transfer in respect of certain processes were refused and no other applications have been made.

Under the Alkali, &c. Works Regulation Act, 1906, air pollution from a wide variety of industrial processes is controlled by the Minister's Alkali Inspectors. The processes registered for this purpose are in the main those giving rise to pollution problems which are unusually serious, or the prevention of which is technically difficult. The Clean Air Act, 1956, which among other things gave local authorities powers to deal with industrial smoke, grit and dust generally, placed on the Alkali Inspectorate the responsibility for dealing with smoke, grit and dust from processes registered under the Alkali Act. But it gave the Minister power to make orders which have the effect of transferring this responsibility to local bodies.

The view is taken that the transfer of control should at present be limited to the largest local authorities, employing experienced staff with the appropriate qualifications. Where control is transferred, he thinks that it should usually be limited to smoke, grit and dust from processes involving fuel combustion.

British Compressed Air Society

The new president of the British Compressed Air Society is Mr. E. A. Martin of Padley & Venables, Limited. Other officers elected, for the 1960/61 session, at the Society's annual general meeting held last month in London, are Lt. Col. K. Reavell (Reavell & Company, Limited) as vice-president; Mr. T. C. Hore (Holman Bros., Limited) as hon. technical director, and Mr. H. S. Parson (Consolidated Pneumatic Tool Company, Limited) becomes hon. publicity officer.

At a luncheon which preceded the annual general meeting, Mr. James H. Darton, special representative in Europe of the International Finance Corporation, spoke on overseas investment in relation to the export of engineering equipment. He reviewed particularly the financial arrangements made by the major manufacturing countries with regard to export credit insurance schemes. He also spoke of the development of the South American Free Trade area, and the very large sums being invested in India and Pakistan. He concluded by saying that the problem of obtaining payment for exports would not be solved if each exporting country were to compete with the next in granting longer and longer export credit.

Forum on Combustion Problems

On Tuesday, May 24, at 10.30 a.m., the Rt. Worshipful the Lord Mayor of Manchester (Alderman Harold Quinney, D.L., J.P.) will open a forum to be held by the Combustion Engineering Association at the Engineers' Club, Albert Square, Manchester. The object of the forum is to discuss problems appertaining to the industrial use of solid, liquid or gaseous fuels and a panel will be on hand to answer questions from the audience. The chairman at the proceedings will be Mr. M. S. Gaskill (of West's Gas Improvement, Limited) and the panel will consist of Mr. K. Brown (National Coal Board), Mr. G. Doxey (Imperial Chemical Industries, Limited), Mr. G. Gill (National Industrial Fuel Efficiency Service), Mr. C. H. F. Hayward (Edwin Danks & Company, Limited), Mr. W. F. H. Howell (North Western Gas Board), Mr. R. Lees (Shell-Mex & B.P. Limited), and Mr. A. E. Lock (Associated Electrical Industries, Limited). The morning session will be from 10.30 a.m. to 12.30 p.m. and the forum will continue in the afternoon from 2.30 p.m. to 4.30 p.m. Non-members of the Association will be welcome and those wishing to attend should get into touch with the secretary, Combustion Engineering Association, North Western Region, West's Gas Improvement, Limited, Albion Ironworks, Miles Platting, Manchester, 10.

European Foundry Apprentice Competition

Apprentices from eight countries will be taking part in the European Foundry Apprentice Competition to be held in Wolverhampton and Wednesbury during the week May 23 to 27. Delegates from these countries will be made up as follow:

	Competitors.	Judges.	Observers.
Austria	2	—	—
Denmark	2	2	—
France	3	3	2
Germany	3	3	4
Holland	2	2	1
Italy	2	1	1
Sweden	1	—	1
United Kingdom	3	3	2

It is interesting to note that the British apprentices will be representing the three main sections of the industry, *i.e.*, iron, steel and bronze. For those wishing to see the competitors in action, part of the practical test is to be televised by the Midland BBC and ITV from the works of F. H. Lloyd & Company, Limited, Wednesbury.

Atlas Copco to manufacture in India

Four million Swedish crowns (£275,000) will be invested by Atlas Copco AB, the international firm of compressed-air engineers, in the first stage of building a factory at Poona, in India. The new subsidiary which will be known as Atlas Copco India (Private), Limited, will produce air compressors and pneumatic rock-drills. Initially its output is estimated at Sw. Kr. 4,000,000 a year. The firm will work in close co-operation with a number of Indian companies, who will act as suppliers of components, notably diesel engines and compressor bodies. Mr. Akbar Hydari is to be chairman of the board of the new company.

It is expected that when the factory is completed at the end of this year, the Indian Minister of Industry, Mr. Manubhai Shah, will perform the opening ceremony.

Personal

Mr. F. R. DIXON and Mr. J. MARTIN have been appointed directors of Mather & Platt, Limited.

Mr. E. N. HIGHTON, a director of Dorman, Long and Company, Limited, is on a visit to New York.

Mr. JOHN A. CARPENTER has been appointed to the board of Drysdale & Company, Limited, Yoker, Glasgow.

Mr. HAROLD HEATH has resigned from the board of the Leeds Fireclay Company, Limited, in view of his other commitments.

Mr. IAN CAMERON, general manager of the Southampton works of John I. Thornycroft & Company, Limited, has been appointed to the board of the company.

Mr. S. FARRER has joined the Bryan Donkin Company, Limited, as managing director and has been appointed a director of its associate company, British Furnaces, Limited.

Mr. RALPH CREDLAND has retired from the board of Widnes Foundry & Engineering Company, Limited, a member of the Thos. W. Ward group. He had been with the group for 62 years.

Mr. W. D. AKESTER, a director of Ransomes, Sims & Jefferies, Limited, ironfounders and engineers, Ipswich, has been elected president of the Agricultural Engineers Association for 1960.

Mr. REGINALD COX, London manager of the Yorkshire Switchgear and Engineering Company, Limited, Leeds, has relinquished that post after 40 years with the company but will continue as a director.

Mr. G. A. ATTER, deputy manager of the Birmingham office of the Stanton Ironworks Company, Limited, has been appointed manager in succession to Mr. G. L. HODGSON, who has retired after 27 years in that post.

Mr. T. L. WATSON, of James F. Low & Company, Limited, textile-machinery manufacturers, Monifieth Foundry, Dundee, has left that company and is taking up a post as director and general manager of Munro Foundries, Limited, New Zealand.

Mr. C. M. A. WHITAKER, director and general manager of Fielding & Platt, Limited, has been elected chairman of the Gloucester Productivity Association. Mr. W. A. LOVELL, secretary and a director of the company, has been appointed deputy managing director.

Mr. J. B. BILTON has been appointed production manager, Redfyre products, Newton Chambers and Company, Limited, Thorncliffe, Sheffield, and Mr. H. HARRISON, has been appointed chief inspector, engineering division, assisted by Mr. C. C. HITCHMOUGH.

LORD FRASER OF LONSDALE, C.H., C.B.E., has been appointed chairman of Capper, Pass and Son, Limited, smelters and refiners of non-ferrous metals, North Ferriby, Yorkshire, in succession to Mr. A. D. PASS, who has retired from that post but remains on the board.

Mr. COLIN MCL. CAMERON, chief engineer with Ransomes and Rapier, Limited, since 1953, has been appointed group engineer, Newton Chambers and Company, Limited. He is succeeded as chief engineer, Ransomes and Rapier, Limited, by Mr. ALFRED T. HEATH.

Mr. E. H. PEPPER, an employee of the East Midlands Gas Board, received a 50-year service award from the chairman of the Board, Mr. R. S. Johnson, on May 6. When Mr. Pepper joined the organization in April, 1910, it was known as the Nottingham Corporation Gas Department.

Professor LINUS PAULING, of the California Institute of Technology, will be the lecturer at a meeting of the Institute of Metals, to be held on July 25 at the Royal Institution, Albemarle Street, London, W.1, commencing 6.30 p.m. The subject of Professor Pauling's lecture will be the "Structure of Metals and Intermetallic Compounds."

Mr. PHILIP GOODING, director of information and assistant secretary of the Cement and Concrete Association, and Mr. WILLIAM MONKTON MATTERSON, designer and engineer specializing in gear-cutting machinery, are to receive the honorary degree of Master of Science of the University of Leeds at a ceremony in the Great Hall of the University on May 19.

Tecalemit, Limited, Plymouth, Devon, announce the following appointments:—Mr. T. R. HARDMAN, executive director (sales); Mr. H. E. JACKSON, executive director (engineering) and Mr. J. E. DRINKWATER, executive director (production). In each case the appointment covers responsibility for the activities of the company and of its subsidiaries.

Having attained the age of 65, Mr. P. M. HOLMAN has relinquished his office of joint managing director of Holman Bros., Limited, Camborne, Cornwall, but remains on the board and continues as chairman. Mr. Holman who joined the company in 1910 will complete 50 years' service in August next. Mr. J. F. HOLMAN is now the managing director of the company.

Mr. EDWARD LOCKWOOD TRIFFITT has been appointed chief civil engineer for the North Eastern Region of British Railways. Mr. Triffitt entered the service of the LNER in 1927 as a graduate pupil in the engineer's office at York. During the war he was successively port superintendent at Algiers, Syracuse, Brindisi and Taranto. He afterwards became assistant director of transportation administration at Rome.

Mr. N. A. ILIFF has been appointed managing director of the Shell Chemical Company, Limited, from May 31 in succession to Mr. L. H. WILLIAMS, who has been managing director since 1955. Mr. Williams is to take up a new executive appointment in Shell's International Chemical Organisation. Mr. JOHN L. BLACK has been appointed general manager of the Shell Haven Refinery, Essex, of Shell Refining Company, Limited, in succession to Mr. JAMES GRANT, who has retired.

Mr. OWEN D. TANNETT, managing director of Stanley Works (Great Britain), Limited, Sheffield, presented Mrs. E. VARAH, a director and company secretary, with an inscribed gold watch to mark her 25 years' service with the firm on May 5. Mrs. Varah began as company secretary at the Rutland Road works when it was operated by J. A. Chapman, Limited. The firm then had a staff of about 80. When the Stanley organization acquired the firm, Mrs. Varah was retained in her post, and was appointed to the board of directors five years ago.

Mr. B. C. WILKINS who retired from the board of Henley Foundries, Limited, Cradley Heath, S. Staffs, on April 8, had been a director since 1945, when the Foundries were known as Oakley Brothers, Limited. Mr. Wilkins commenced his career as a clerk in the accounts department of W. T. Henley's Telegraph Works Company, Limited, in 1912 and was appointed assistant to the accountant in 1919. He became chief accountant in 1927, a position he continued to fill until October, 1954, when he retired from the position but was retained on special duties with the company until 1956.

News in Brief

FIRST QUARTER net profits of Aluminium, Limited, are estimated at $9,000,000 (30 cents a share), compared with only $2,300,000 (8 cents a share) in the same period last year.

NEW TRACTOR PLANT is to be built by the Ford Motor Company, Limited, at Basildon (Essex), at a cost of £10,000,000. The project is the second part of the company's £70,000,000 expansion programme.

THE LOWEST bid for a contract to supply two medium-sized turbines for the McGee Dam scheme in Kansas was put in by the English Electric Company, Limited, with a tender of $1,075,547 (£384,123). The lowest American bid was $1,178,470 (£420,881).

SINCE the Board of Trade refuses to grant industrial development certificates to allow expansion at Coventry, the British Piston Ring Company, Limited, is to consider expanding outside the city, states the chairman and managing director, Mr. V. W. Oubridge.

IMPERIAL CHEMICAL INDUSTRIES, LIMITED, is consulting employees on a proposal that in addition to the ICI pension funds they should all join the new state graduated pension scheme. The company does not intend to alter its scheme so long as benefits and contributions under the state scheme remain at the initial rates.

NEW UNITED STATES company, named the Perkins Engine Company, Inc., has been formed with headquarters in Detroit, to market the products of F. Perkins, Limited, diesel-engine manufacturers, of Peterborough. It will provide technical and service facilities as well as expanding the already substantial sales of Perkins power units in the US.

A NEW MINING OPERATION, the Clarabelle Open Pit, will be started by the International Nickel Company of Canada, Limited, on an outcropping orebody in the Clarabelle and Lady Lakes area to the southwest of the company's Murray Mine in the Sudbury district. The pit is scheduled to go into production in the latter part of 1961. Production from this pit will replace tonnage now being obtained from other Inco mines. No increase in the number of employees is contemplated.

SANDVIK STEEL WORKS (Sweden) have decided to build a plant for production of steel tubes according to the so-called hot-extrusion method. The building costs have been calculated at about 30 million Swedish crowns, equivalent to over £2,000,000, and the new mill is scheduled for operation at the beginning of 1962. Licence to produce by this method has been granted by the French company, Cefilac, but the main part of the machinery and equipment will be delivered by the British firm, Loewy Engineering Company, Limited.

THE POWDER METALLURGY JOINT GROUP of the Iron and Steel Institute and the Institute of Metals is arranging a meeting to take place on Thursday and Friday, December 15 and 16, at Church House, Great Smith Street, London, S.W.1. A symposium on the "Practical Aspects of Pressing Metal Powders" will occupy the first day, the second day will be devoted to discussion of papers. Those wishing to make contributions to the symposium should first obtain notes on preparing manuscripts from the secretary of the group, at 17, Belgrave Square, London, S.W.1.

BRITISH OXYGEN COMPANY, LIMITED, announce that additional plant is to be supplied to both the Kampala and Nairobi works of East African Oxygen, Limited, a member of the British Oxygen group. A 1,000-cub. ft. capacity static-oxygen plant is on order for Kampala, while a 1,000-cub. ft. air-separation unit, an alumina drier battery and BOC 110 expansion engine are being supplied to Nairobi. The new plant for Nairobi is due in production in June, 1961, that for Kampala, which will double the present production capacity, is expected to enter service in September, 1961.

BOARD OF TRADE FIGURES show that exports of mechanical-handling equipment from Great Britain are substantial, despite strong overseas competition. In the first two months of this year, the total value of exports of industrial trucks and tractors and other mechanical-handling equipment, excluding mining and earth-moving machinery, was over £4,100,000, compared with £3,500,000 for the same period of 1959. The biggest single customer, India, spent in these first two months over £700,000, a considerable increase over its expenditure last year, when in January and February it bought £589,000 worth of British equipment.

THE GRADUATES AND STUDENTS section overseas tour in 1960 of the Institution of Chemical Engineers will be visiting chemical companies in northern France. The proposed dates for the tour are departure from London on Saturday, September 17, and return on Saturday October 1. The Third International Exhibition of Applied Chemistry will be held in Belgrade, Yugoslavia, from June 21 to 30, 1960. The exhibitions will be divided into several internal exhibitions. Further information may be obtained from the organizing committee, *Exposition de l'Industrie Chimique*, Bulevar Voivode Misica, 14, Boite Postale 408, Belgrade.

ASTON ALUMINIUM WAREHOUSE COMPANY, LIMITED, announce the opening of new warehouses on May 2 in Leeds and in Nottingham. The Yorkshire warehouse (at Bruntcliffe Lane, Morley; 'phone Morley 4251) will be managed by Mr. P. Brown, until recently area-manager for Reynolds T.I. Aluminium Limited. The company will hold a wide range of aluminium and aluminium-alloy semis for all trades and will have sheet cutting and bending facilities up to 8-ft. The Nottingham warehouse (at Bell Street; 'phone Nottingham 83241) will be managed by Mr. H. Smith and will be operated in conjunction with the main warehouse in Birmingham.

FESCOL LIMITED, electro-chemical depositors and engineers, London, N.7, has remained free of labour disputes since it was founded 40 years ago, and more than 50 per cent. of the present employees have been with the firm for ten years or longer—one in every six for more than 25 years. On April 20, the firm held a lunch in London for its "25-Year Club" at which seven new members were introduced, bringing the total membership up to 35. Each new member was presented with a clock in recognition of long service. The main activity of Fescol, Limited, is the electro-deposition of hard-wearing metals such as nickel and chromium on machined or cast metal components.

ENGLISH STEEL CORPORATION, LIMITED, Sheffield, are to carry out a vast expansion programme at their 500-acre site at Tinsley Park at a cost of £26,000,000. The project, which includes the provision of blooming, billet and bar rolling-mills and three 100-ton electric-melting furnaces, is expected to be in operation in 1963. The works will cover 120 acres and with the new spring shop one third of the Tinsley Park site will be used. The scheme has the support of the British Iron and Steel Federation and consent has been given by the Iron and Steel Board. The project will bring the total melting capacity of the English Steel Corporation group for the production of alloy and special carbon steels towards 1,000,000 tons per year.

Mr. DAVID ROWLAND, speaker at a luncheon of the Non-Ferrous Club in Birmingham last week, stressed the value of credit insurance to traders. He said that he thought that in future there might be a closer relationship between insurance companies and inquiry organisations as to the credit worthiness of individual buyers, and was of the opinion that the credit rating system popular in the United States might be extended in this country. At the meeting a collection, taken on behalf of the Royal Commonwealth Society for the Blind, realised £20 8s. 6d. Members were reminded that the annual golf meeting of the Society was to be held at Stratford-on-Avon on June 21, and that applications for participation in this event should be sent to the golf secretary, c/o 9, Charlotte Street, Birmingham 3.

ABOUT 400 BIRMINGHAM EMPLOYEES of the Canadian controlled company are to have a chance of buying shares in the business—by instalments if they wish. The offer is open to staff and work people at the Handsworth works of the Northern Aluminium Company, Limited, as well as those in other companies controlled by Aluminium, Limited, of Canada. The shares in the parent company will be offered at about 15 per cent. less than the price quoted on the Montreal Stock Exchange. Employees elegible for the offer were those with at least 12 months continuous service and with an annual wage of not less than 1,500 Canadian dollars—about £550. About 400 of the Handsworth workers will qualify. They can buy shares up to a value of 10 per cent. of their annual earnings and can pay either in cash or by instalments over 18 months.

Unemployment and Sickness

A bigger difference between a subsidiary occupation and full-time employment is the main change made in the amended regulations* to the subsidiary occupations rule which came into force on May 9. This rule enables a claimant to do some spare-time work without loss of unemployment benefit or credits, and a condition on which benefit may now be obtained is that the spare-time occupation must be " different in nature " from the full-time employment for which the claimant is available.

A review has also been made by the National Insurance Advisory Committee of the present rules governing the issue of medical certificates for incapacity for work and for certification of confinement under the National Insurance Scheme, and its report was published on May 5†.

* National Insurance (Unemployment and Sickness Benefit) Amendment Regulations, 1960, S.I.1960, No. 781, price 3d., and the National Insurance (Contributions) Amendment Regulations, 1960, S.I.1960 No. 782, price 3d.† Cmnd. 1021, price 1s. 0d. Obtainable from H.M. Stationery Office or through any bookseller.

Bag Filters. In publication No. 82, W. C. Holmes & Company, Limited, Turnbridge, Huddersfield, describe—with the aid of photographs, line drawings and graphs—Retroflux bag-filters. It is claimed that the new design has an extremely efficient and continuous method of cleaning the bags, which ensures that large volumes can be handled with constant pressure-drop and high collection efficiency. It is stated that an efficiency in excess of 99 per cent. for all particles (including those of sub-micron size) can be guaranteed.

Obituary

The death took place on May 5 of Mr. A. Logan who for the past 10 years was associated with technical development at Harborough Construction Company, Limited. Prior to that he was for many years with Light Production, Limited, at Slough, and earlier still at St. Peters Works of Hawthorn Leslie & Company, Limited.

A Fellow of the Institution of Metallurgists, Mr. Logan joined the Institute of British Foundrymen in 1918 and was a past branch president and section president. Prominent always in light-alloy foundry matters, he was a member of the Institute's Technical Council and recipient of a diploma award for a paper delivered to that body. He was also instrumental in piloting the Institute's proposals regarding moulding-box sizes to the final issue of a British Standard. At the time of his death (aged 62) he was preparing to deliver the IBF T.S.45 sub-committee's report (on non-ferrous melt-quality tests) to the Malvern Conference. The quiet unassuming manner with which he cloaked very real abilities will long be missed at gatherings of technical foundrymen.

Mr. GEORGE TREVETHICK, who has died at Carlton-on-Trent, Nottinghamshire, at the age of 68, was a direct descendant of the Cornishman, Richard Trevethick, who pioneered the railway locomotive in Britain.

The death took place of Mr. JAMES DOWNS, until recently North of England area manager of Brown, Bayley Steels, Limited, Sheffield. He was born and educated in Malta but came to England to join the family concern of Rose, Downs & Thompson, Limited, engineers and ironfounders, of Hull.

The death has occurred of Mr. W. J. BELSEY, who until his retirement in 1944 worked for 42 years for the British Thomson-Houston Company, Limited, now AEI (Rugby), Limited. He was 86. After retiring from the managership of the marine department, he remained with the company for a time in a consultative capacity.

Former vice-president and director of the Monsanto Chemical Company, Missouri, USA, Mr. FRANCIS J. CURTIS, has died aged 65. He was president of the Society of Chemical Industry and past-president of the American Institute of Chemical Engineers. Last November he received the institute's Founders' Award for his outstanding contributions to chemical engineering.

Ether Langham Thompson (Italiana) Limited

As the first step in a policy of expansion in the export field, Ether Langham Thompson Limited, announce the formation, of a new subsidiary company, Ether Langham Thompson (Italiana), Limited, with offices and factory located at Via Bisleri 19, Milano.

The new company will market and manufacture products of the subsidiary companies of Ether Langham Thompson, namely: Ether, Limited; J. Langham Thompson, Limited; Electro Methods, Limited; Datum Metal Products, Limited; and Automation Systems & Controls, Limited. In addition, agency Agreements have been completed between the Italian company and a number of other British and international companies engaged in the field of instrumentation. The board of directors of the Italian company will consist of: Mr. J. Langham Thompson, chairman; Dr. Bignardi and Dr. Scandola, joint managing directors; Mr. F. W. Coulling and Mr. F. B. Duncan.

IVE Annual Conference

The twenty-sixth annual conference of the Institute of Vitreous Enamellers promises to be one of the most interesting yet held, and plans are now being made for a number of projects to run in conjunction with the usual technical papers and social functions.

In the conference headquarters, at the Grand Hotel, Birmingham, there will be a small trade fair, "Confair 1960," which will be open all through the conference period (September 28 to 30). It will be a combination of conference and trade fair offering a unique opportunity for suppliers of goods and services in the vitreous enamelling industry to reach their customers. It will be held in the same suite of rooms as the conference, and will be open all day so that delegates will be able to visit the fair before, between and after the sessions. The organizers are supplying an attractive "shell-scheme," which will enable exhibitors to arrange their displays to advantage within the overall set-up. For further details write to the secretary, the Institute of Vitreous Enamellers, Ripley, near Derby.

Technical Papers and Works Visits

The following technical papers have so far been arranged for presentation: "Acid and Alkali Resistance for Chemical Plant," by G. E. Charlish; "Influence of Chemical Composition of Enamel on its Alkali Resistance," by A. N. Revell; "Use of Zinc in Enamelling," by Dr. W. L. German; "Abrasion Resistance" (sub-committee report); "Aluminium for Enamelling," by A. W. Brace, and "Enamelling Aluminium," by C. Vickers. Works visits have already been arranged to the following companies:—Ernest Stevens, Limited; Ferro Enamels, Limited; the Valor Company, Limited; Bilston Foundries, Limited, and Cannon Industries, Limited.

In the Engineering Centre, New Street, there will be an educational exhibition entitled "Vitreous Enamelling and You," stressing the opportunities available for young people entering the industry.

ESC Bogie-frames for Chile

The one-piece cast-steel bogie frames shown ready for despatch on Goole dockside have been made by the English Steel Castings Corporation, Limited, for electric locomotives being assembled for Chilean State Railways. This design of bogie is the first three-point loaded type to be produced in the ESC steel foundry at Grimesthorpe, and also represent the company's first continental order. The castings, of which 74 have been ordered, are 22-ft. long, 8½-ft. wide, weight 4½ tons, and were machined in the Hawke Street machine-shop of the Corporation.

AFS Congress and Exposition

Heading the list of distinguished foreign speakers at the national Castings Congress and Exposition of the American Foundrymen's Society, currently being held at Philadelphia, is Dr. Julian Nekhendzy, Professor of Technical Science and Dean of Foundry Production, at the Leningrad Polytechnic Institute, Russia. According to Wm. W. Maloney, AFS general manager, Dr. Nekhendzy is one of Russia's foremost metallurgists and a recognized authority in the field of castings. He has established standards for castings in Russia and has authored over 100 scientific papers in the USSR on the casting of alloys.

British Contributors

Other speakers are from England, Belgium and Australia. Mr. R. R. Woodward and Mr. H. J. Proffitt are presenting a report on British die-casting practices in aluminium, sponsored by the Institute of British Foundrymen. Other British authors include Mr. W. B. Parkes and Mr. R. G. Godding of the British Cast Iron Research Association, and Mr. E. C. Lewis, Alumasc Limited. Professors A. J. Anderson and G. J. Sutton of the University of New South Wales, Sydney, Australia, are quoting their latest research findings as to the effects of variation of some physical and chemical conditions on the properties of bentonite suspensions.

Other Visiting Speakers

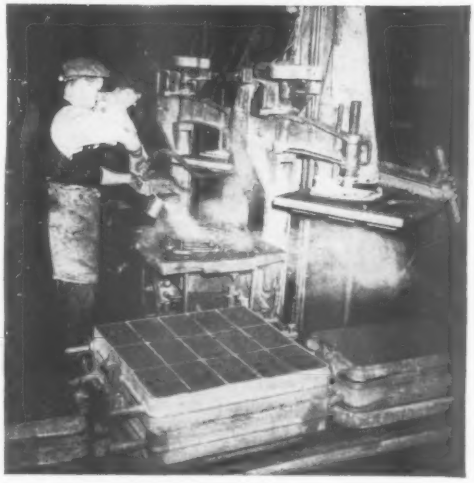
Other foreign speakers include Professor A. De Sy of the University of Ghent, Belgium and Mr. K. Schneider of Aluminiumwerke, Nurnberg, Germany. A number of Canadian university, government and industry authors are presenting original papers at the congress, including a report on Canadian non-ferrous and iron-foundry sand-practice by Mr. A. E. Murton of the Department of Mines and Technical Surveys. A total of 217 speakers and panel members take part in the 58 sessions making up the technical programme. Of this number, 65 represent overseas and Canadian industry, universities and government agencies. All-day seminars, panel discussions, and symposiums are being held at Philadelphia's Convention Hall during the hours the show is open—9.00 a.m. to 5.30 p.m.

As reported in the JOURNAL last week, over a dozen leading foundries in the Philadelphia area are holding "Open House" during the Congress, as are also a number of foundries in the immediate Philadelphia area, in New Jersey and in Delaware.

Typewriter Business coming to UK

Founders will be interested to learn that production of one of the American Smith-Corona portable typewriters is shortly to be concentrated in England. Mr. V. G. Severin, vice-president of the international division of Smith-Corona Marchant Incorporated, who was recently in Britain for talks with Mr. J. C. Holdship, production director at the West Bromwich factory of SCM's British company, Smith-Corona, Limited, revealed that plans provide for a fourfold increase in output from the West Bromwich factory. On attainment of this production—"sooner rather than later"—90 per cent. of the typewriters will be exported, the United States taking 60 per cent. In announcing the arrangement, Mr. Severin said "We are looking to Britain for ideas as well as for engineering skills and production."

REDUCE YOUR COSTS!



Illustrations of "PLP" in use by courtesy of Messrs. Henry Wallwork & Co., Ltd., Red Bank, Manchester.

BY USING

"PARTEX" LIQUID PARTING ("PLP")

ONE spraying followed by AT LEAST ten trouble-free "lifts"—no hold-ups clearing sprayer nozzles — "PLP" IS SEDIMENT FREE! That is one reason why moulders speak so highly of "PLP"—pattern reproduction is so accurate—the sand parts from the Plate cleanly—every time! Box after box—just like that! **In fact "PLP" is the logical LIQUID PARTING for all plate work and core box application.**

The addition of a small quantity of "PLP" to Core Sand will greatly improve the working properties of the mix and facilitate clean stripping from the core box.

If you are not already using "PLP" ask for our prices and free sample. You can save £s for the asking.

Speedy and Economical! It's Sediment Free!!

Manufactured by **F. & M. SUPPLIES LTD.**

4 BROAD STREET PLACE, LONDON, E.C.2.

'Phone: LONdon Wall 7222

Raw Material Markets

Iron and Steel

The steelworks, which are now producing at about 93 per cent. of capacity, are utilising large tonnages of basic pig-iron. Home producers are supplying almost entirely their pig-iron requirements as only a small proportion is being obtained from imports. Stocks previously held by the furnaces have been practically eliminated and, although increased quantities are being obtained from larger and more modern units, all available supplies are being fully absorbed.

From the current overall outputs of pig-iron over 80 per cent. consists of basic steelmaking pig-iron and, in addition, substantial tonnages of hematite are also being supplied direct to the steelworks.

The supply of foundry grades of pig-iron is keeping pace with demand and producers are able to cover present needs both for consumption and stock requirements. The engineering and speciality foundries continue to take up substantial tonnages of low phosphoric irons, together with good quantities of hematite, and some of the refined grades. Demands on these foundries for high duty castings from the many users are at high level.

With the continued good demand for builders castings and a steady call from the domestic utensil trade many of the light foundries are able to obtain reasonably good outputs. The jobbing and textile foundries are fairly well employed but these, together with the light foundries, have capacity to spare. There is sufficient high phosphorus foundry pig-iron and producers could step up deliveries if demands warranted. Consignments of this iron are being shipped regularly to oversea buyers.

The foundries are fairly well covered for their scrap supplies, although there is a persistent demand for the better and heavier grades of steel, cast-iron and machinery scrap. Foundry coke deliveries are satisfactory and ganister, limestone, and firebricks are available to requirements.

The re-rollers continue to indent for large tonnages of steel semis and, although home steelworks are able to satisfy the major portion of these requirements, present deliveries do not satisfy demands fully, particularly for 2-in. billets. Stocks at many of the re-rollers are negligible and production depends entirely on arrival of consignments. To overcome this to a certain extent some tonnages, although comparatively small, are being imported

There is a substantial demand for all the products of the re-rollers and orders at present on hand will keep them fully occupied for some months ahead. Outputs, however, continue to be affected adversely by the shortage of suitable labour.

Non-ferrous Metals

Copper is relatively quiet in London, although the market remains sensitive. The two most important factors affecting prices are still the question of supplies and the strike position in Chile. In so far as supplies are concerned, this problem seems to be on its way to being solved, as refined copper stocks in LME warehouses made a further recovery last week and increased by 650 tons to 3,229 tons. This inclined the market easier.

On the other hand, the strike at the Anaconda Copper Company's mines at El Salvador and Potrerillos in Chile are still on, although the attempt by the union to effect a general strike in the Chilean copper industry has not, as yet, materialized. It would appear that the general strike has been postponed, partly because the Chilean Labour Minister is hoping to arrange further negotiations between Anaconda and the unions, and partly because the Government may consider such strike action as illegal. The situation has exercised a somewhat bearish influence on the market and prices have dropped accordingly with the backwardation now closed up to around £7 a ton.

The outlook is for steadier conditions with narrower price fluctuations. However, if the copper industry in Chile ceases production, the market will then be dependent on the supply position.

In the US physical copper continues to move slowly and the price structure remains unchanged at 33 cents a pound for both producers and custom smelters.

Tin has been much in the news, owing to the International Tin Council's announcement last week that it had decided to withdraw the Buffer Stock Manager's authority to buy and sell tin, except when the price is below £780 or above £830 a ton. Since it had been believed that the Tin Council was wedded to the idea of keeping the prices permanently below £800 a ton, this announcement initially injected a bullish attitude into the market. However, the reaction in the East was to view it otherwise and this feeling later repercussed in London and the price is now well below £790 a ton. In the US the market is quiet with the price fluctuating narrowly around 99 cents a pound.

Lead continues to be a firm market in London with demand good and prices holding up well around £77 a ton. In the US, the market is quietly steady and the New York spot price is unchanged at 12 cents a pound.

Zinc is a mixed market in London, although, on balance, consumer interest remains at a satisfactory level. Yet, the undertone is sensitive and price changes occur on relatively small market operations. In the US the market is quiet, particularly for special high grade metal, used by the die-casting industry. The US price is unchanged at 13 cents a pound.

Increases in Capital

ATLANTIC METAL COMPANY, LIMITED, London, W.C.2, increased by £15,000, in £1 ordinary shares, beyond the registered capital of £10,000.

COLD PRECISION FORGINGS (D. & C.), LIMITED, London, E.C.2, increased by £20,000, in £1 shares, beyond the registered capital of £10,000.

HOLINTER, LIMITED, ironmasters, etc., of London, E.C.4, increased by £80,000, in £1 ordinary shares, beyond the registered capital of £20,000.

WELLINGTON ENGINEERING WORKS, LIMITED, Tipton (Staffs), increased by £349,900, in £1 unclassified shares, beyond the registered capital of £100.

MERSEY CASING & BY-PRODUCTS COMPANY, LIMITED, Widnes, increased by £50,000, in £1 ordinary shares, beyond the registered capital of £100,000.

HAYES IRON & STEEL COMPANY, LIMITED, Lye, Stourbridge, increased by £20,000, in £1 ordinary shares, beyond the registered capital of £10,000.

AVAMORE ENGINEERING COMPANY, LIMITED, Denham (Bucks), increased by £4,000, in £1 "B" ordinary shares, beyond the registered capital of £17,000.

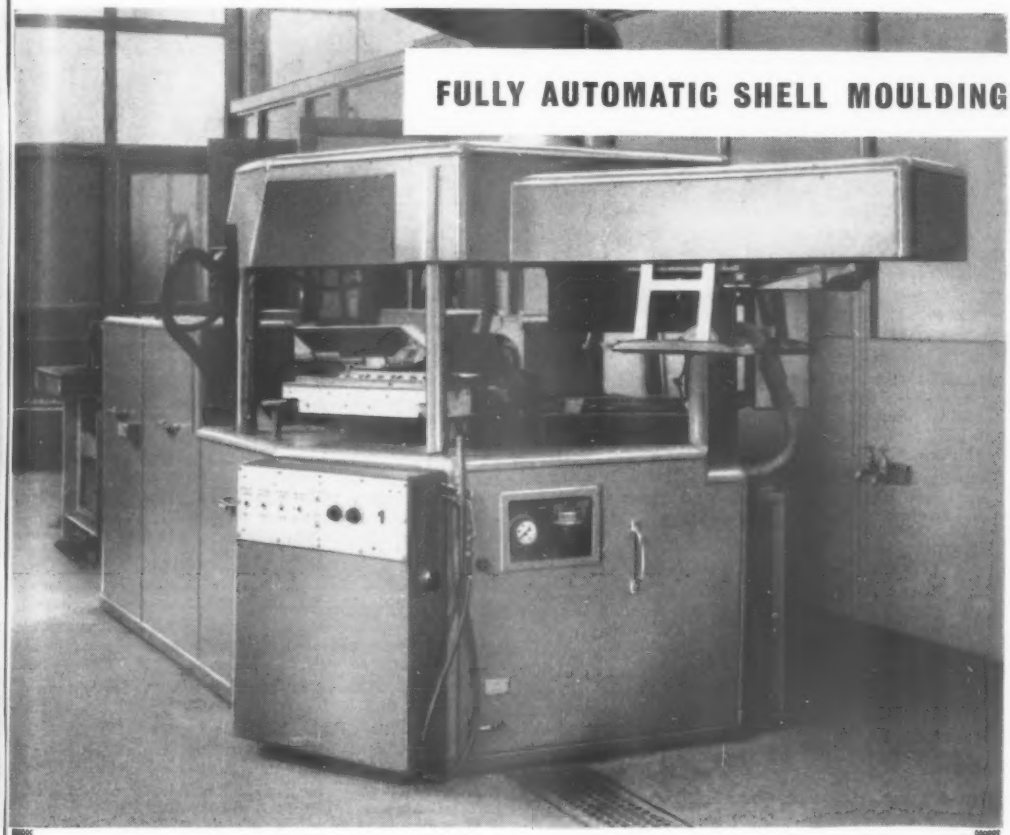
COUNTY PRESSINGS ENGINEERING, LIMITED, Blackmore (Essex), increased by £10,000, in £1 ordinary shares, beyond the registered capital of £5,000.

HEAD WRIGHTSON & COMPANY, LIMITED, Thornaby-on-Tees, increased by £1,000,000 in 5s. ordinary shares, beyond the registered capital of £2,500,000.

SKEFKO BALL BEARING COMPANY, LIMITED, Luton (Beds), increased by £2,500,000, in £1 ordinary shares, beyond the registered capital of £5,000,000.

JAMES MILLS & COMPANY (ENGINEERS), LIMITED, Heywood (Lancs), increased by £20,000, in £1 preference shares, beyond the registered capital of £35,000.

E. BOYDELL & COMPANY, LIMITED, engineers, etc., of Manchester, increased by £180,000, in £1 ordinary shares, beyond the registered capital of £400,000.



Production rate 75 shells per hour

The new Baker Perkins Shell Moulding Machine is fully automatic in its operation. The sand/resin mixture supplied to the storage hopper is automatically fed to the machine. The finished shells are automatically removed from the ejection station, and from there if required to a suitable conveyor.

Short runs are entirely practicable, pattern changing being simple and quick, taking only five minutes and effected single-handed.

On production, shells 18" x 12" weighing 4¼ to 4½ lbs. are produced at the rate of 75 per hour maximum.

Baker Perkins SHELL MOULDING MACHINES

For further details, please write to:

Baker Perkins Ltd.

Engineers

BEDEWELL DIVISION · HEBBURN-ON-TYNE · Co DURHAM

PHONE: JARROW 897124

BP/F5

Current Prices of Iron, Steel, and Non-ferrous Metals

(Delivered unless otherwise stated)

May 11, 1960

PIG-IRON

Foundry Iron.—No. 3 IRON, CLASS 2, 10-ton lots or over: Middlesbrough, £21 6s. 0d.; Birmingham, £20 18s. 3d.

Low-phosphorus Iron.—Over 0.10 to 0.40 per cent. P, 10-ton lots or over, £23 5s. 0d., delivered Birmingham, £23 10s. 0d., delivered Grangemouth.

Cylinder and Refined Irons.—North Zone, £25 6s. 6d.; South Zone, £25 9s. 0d.

Refined Malleable.—P, 0.10 per cent. max.; North Zone, £26 6s. 6d.; South Zone, £26 9s. 0d.

Hematite.—Si up to 2 per cent., S. & P. over 0.03 to 0.05 per cent., 10-ton lots or over: N.-E. of England (local iron), £23 19s. 0d.; Scotland (Scotch iron), Zone S.1, £24 5s. 6d.; Sheffield, £25 7s. 6d.; Birmingham, £25 14s. 0d.; Wales (Welsh iron), £23 19s. 0d.

Basic Pig-iron.—£20 3s. 0d., delivered Staffs, Derbyshire, Notts, Lincs, Rutland, Northants, and Leicestershire in 10-ton lots or over.

FERRO-ALLOYS

(Per ton unless otherwise stated, delivered)

Ferro-silicon (6-ton lots and over).—45 per cent. Si, £41 10s. 0d. to £44 0s. 0d., scale 15s. 0d. per unit, lumpy; 75 per cent. Si, £57 0s. 0d. to £62 10s. 0d., scale 15s. 0d. per unit, lumpy.

Ferro-vanadium.—50/60 per cent., 22s. 6d. per lb. of V.

Ferro-molybdenum.—65/70 per cent., carbon-free, 12s. 10d. per lb. of Mo.

Ferro-titanium.—20/25 per cent., 2-3 per cent. Cu, £250 0s. 0d.; 38/40 per cent., commercially carbon-free, £287 0s. 0d.

Ferro-tungsten.—80/85 per cent., 11s. 6d. per lb. of W.

Tungsten Metal Powder.—98/99 per cent., 14s. 6d. per lb. of W.

Ferro-chrome (6-ton lots and over, lumpy).—4/6 per cent. C, £78 10s. 0d. to £82 10s. 0d., basis 60 per cent. Cr. scale 26s. 0d. to 28s. 6d. per unit; over 6 per cent. C, £77 0s. 0d. to £80 10s. 0d., basis 60 per cent. Cr, scale, 26s. 0d. to 28s. 6d. per unit; 2 per cent. C,* 1s. 8d. to 1s. 11d. per lb. Cr; 1 per cent, C,* 1s. 8½d. to 1s. 11½d. per lb. Cr; 0.15 per cent. C,* 1s. 9½d. to 2s. 0½d. per lb. Cr; 0.10 per cent C,* 1s. 9¾d. to 2s. 0¾d. per lb. Cr; 0.06 per cent. C,* 1s. 10¼d. to 2s. 1d. per lb. Cr.

Metallic Chromium.—98/99 per cent., 6s. 10d. per lb.

Metallic Manganese.—94/96 per cent., carbon-free, £275 0s. 0d.; 9 6/98 per cent., £285 0s. 0d.

Ferro-columbium.—65/67 per cent., Cb + Ta, 19s. 9d. per lb., Cb + Ta.

Ferro-manganese (Standard).—78 per cent., £61 10s. 0d.

SEMI-FINISHED STEEL

Re-rolling Billets, Blooms, and Slabs.—BASIC: Soft u.t., 100 tons & over, £31 15s. 6d.; tested, 0.08 to 0.33 per cent. C, 6 to 35 tons, £33 15s. 6d.; hard (0.41 to 0.60 per cent. C), under 10 tons, £34 17s. 0d.; silico-manganese, under 10 tons, £43 16s. 6d.; free-cutting, under 10 tons, £36 14s. 6d. SIEMENS MARTIN ACID (under 10 tons): Up to 0.25 per cent. C, £41 1s. 0d.; silico-manganese, £44 4s. 0d.

Billets, Blooms, and Slabs for Forging and for Stamping (under 10 tons).—Basic, soft, up to 0.33 per cent. C, £38 10s. 0d.; basic, hard, over 0.41 up to 0.60 per cent. C, £39 12s. 6d.; acid, up to 0.25 per cent. C, £43 4s. 0d.

* Average 68-70 per cent.

FINISHED STEEL

Heavy Plates and Sections (1 ton to 10 tons).—Ship plates (N.-E. Coast), £41 12s. 0d.; boiler plates (N.-E. Coast), £44 2s. 0d.; floor plates (N.-E. Coast), £43 10s. 0d.; angles (N.-E. Coast), £38 16s. 6d.; joists (N.-E. Coast), £38 12s. 6d.

Small Bars, Sheets, etc.—Rounds and squares, under 3 in., and flats 5 in. wide and under, untested soft basic, 50 tons and over, £39 1s. 0d.; under 10 tons to 4 tons, £40 18s. 0d.; under 4 tons to 2 tons, £41 3s. 0d.; hoop and strip, coils, 100 tons and over, £38 0s. 0d.; uncoated strip mill coils, hot rolled, under 3 mm. to 12g., 25 tons to under 50 tons, £43 16s. 0d.; black sheets (hand mill), 24g., 10 tons and over, £57 14s. 6d.; galvanized corrugated sheets, 24g., 10 tons and over, £68 5s. 0d.

Alloy Steel Bars.—1 in. dia. and up: Nickel, £67 17s. 0d.; nickel-chrome, £98 11s. 0d.; nickel-chrome-molybdenum £111 4s. 0d., in lots of 5 tons to under 10 tons.

NON-FERROUS METALS

Copper.—Cash, £249 0s. 0d. to £249 10s. 0d.; three months, £243 10s. 0d. to £244 0s. 0d.; settlement, £249 10s. 0d.

Copper, Tubes, etc.—Solid-drawn tubes, 2s. 6d. per lb.; rods, 275s. 6d. per cwt. basis; 20 s.w.g., 310s. 6d. per cwt.

Tin.—Cash, £786 0s. 0d. to £786 10s. 0d.; three months, £784 0s. 0d. to £784 10s. 0d.; settlement, £786 10s. 0d.

Lead (Refined Pig).—First half May, £77 12s. 6d. to £77 15s. 0d.; first half August, £76 10s. 0d. to £76 12s. 6d.

Zinc.—First half May, £92 10s. 0d. to £92 12s. 6d.; first half August, £91 10s. 0d. to £91 15s. 0d.

Zinc Sheets, etc.—Sheets, 15g. and thicker, all English destinations, £127 12s. 6d.; rolled zinc (boiler plates), all English destinations, £125 7s. 6d.; zinc oxide (Red Seal), d/d buyers' premises, £105 0s. 0d.

Brass Tubes, etc.—Solid-drawn tubes, 2s. 0¾d. per lb.; sheets to 10 w.g., 225s. 6d. per cwt.; wire, 2s. 10¾d.; rolled metal, 225s. 6d. per cwt.

Brass (Brazing).—BS1400, B3, £169; B6, £221.

Brass (High Tensile).—BS1400, HTB1, £198; HTB2, £217; HTB3, £231.

Gunmetal.—BS1400, LG2, £210; LG3, £219; G1, ½%, £276; G1, 1%, £263.

Phosphor Bronze.—BS1400, PB1 (AID released), £311; BS1400, 90/10/1, £301.

Leaded Phosphor Bronze.—BS1400, LPB1, £230.

Phosphor Bronze Strip, etc.—Strip, 317s. 9d. per cwt.; wire, 4s. 4d. per lb.; rods, 3s. 6¾d.; tubes, 3s. 6¾d.; chill cast bars, solids 3s. 6¼d.; cored 3s. 7¼d. (CHARLES CLIFFORD, LIMITED).

Nickel Silver, etc.—Rolled metal, 3 in. to 9 in. wide × 0.056, 4s. 0¾d. per lb.; round wire, 10g. in coils (10 per cent.), 4s. 5¾d.; special quality turning rod, 10 per cent., ½ in. dia., n straight lengths, 4s. 4¾d. All prices are net.

Other Metals.—Magnesium, ingots 2s. 2½d. to 2s. 3d. per lb. Antimony, English, 99 per cent., £190 0s. 0d. Quicksilver, ex-warehouse, £71 0s. 0d. Nickel, £600 0s. 0d. Aluminium, ingots, £186 0s. 0d.; aluminium bronze (BS1400), AB1, £253; AB2, £262.

Employers' Attitude criticised

Proposing the toast of "The Bradford Engineering Society" at the annual dinner of the Society at the Connaught Rooms, Bradford, the guest of honour, Mr. G. Collin Hepworth, managing director of Associated Engineering, Limited, and a former joint managing director of Hepworth & Grandage, Limited, of Bradford, said there were times when he found it difficult to understand the outlook of the Engineering Employers' Federation and criticised the employers' attitude to trade union demands. Taking the shorter working week issue as one example, he said the trade unions had asked for it when trade was good, bad and indifferent, and had always been told that "the time was not opportune." He added "How much better it would have been for the management to have come forward and offered a shorter working week! It had happened anyway, so why not give it and get the credit for it?"

He went on to criticise firms with outdated management technique regarding labour relations and stressed the need for good relations between employers and employed.

Much of a company's success, he said, depended on the workman's relations with his employer who must recognize the dignity of the individuals who worked under him. Industry should anticipate the demands of labour, watch for trouble spots, and take steps to prevent them developing into festering sores. "Just once in a while let us give something before it is asked for," said Mr. Hepworth.

Referring to "technical knowledge" in regard to management, he said he thought too much emphasis was placed on academic degrees when common sense was the greatest single factor influencing successful business. There was room for the back-room boys, the egg-heads and the technicians. It was unfortunately too often true, however, that the more brilliant a scientist or technician was the less he seemed to be capable of grappling with day-to-day problems.

Other speakers included the Lord Mayor of Bradford (Coun. Ernest England) and Mr. W. Marshall, a past-president of the Society.

IBF Malvern Conference Fund

Contributions to the IBF Malvern Conference are still being received, and the Council of the Institute of British Foundrymen gratefully acknowledges the latest donations listed below:—

	£	s.	d.
Previously acknowledged	2,555	2	0
Johnsons Rolls, Limited	10	0	0
J. C. Abbott and Company, Limited ...	7	7	0
Edward Matthews, Limited	10	10	0
Alexander Comley (Foundry Division), Limited	5	0	0
William King, Limited	10	10	0
Dudley and Dowell, Limited	2	2	0
E. W. Wynn (Ironfounders), Limited ...	10	10	0
Foundry Trades' Equipment and Supplies Association, Limited (second donation)	10	0	0
	£2,621	1	0

PIG IRON, All Grades
METALLIC ABRASIVES
SHOTBLASTING MACHINERY
FOUNDRY MACHINERY

WILLIAM
JACKS
AND COMPANY LIMITED

HEAD OFFICE
WINCHESTER HOUSE
OLD BROAD STREET
LONDON EC2.
LONdon Wall 4774

And at:
BIRMINGHAM 2
39 Corporation Street,
Midland 3375/6

GLASGOW C2
93 Hope Street,
Central 9969

FERRO SILICON 12/14%
ALLOYS & BRIQUETTES
FOUNDRY COKE
LIMESTONE
GANISTER
MOULDING SAND
REFRACTORIES

CLASSIFIED ADVERTISEMENTS

PREPAID RATES: Fifteen words for 7/6 (minimum charge) and 4d. per word thereafter. Box Numbers 2/6 extra (including postage of replies). Situations wanted 2d. per word throughout.

Advertisements (accompanied by a remittance) and replies to Box Numbers should be addressed to the Advertisement Manager, Foundry Trade Journal, John Adam House 17/19, John Adam Street, Adelphi, London, W.C.2. If received by first post Monday advertisements can normally be accommodated in the following Thursday's issue.

SITUATIONS WANTED

FOUNDRY MANAGER, 42, ferrous and non-ferrous, jobbing, mechanisation, seeks position. Box FM621, FOUNDRY TRADE JOURNAL.

SALES EXECUTIVE Foundry Industry, wide technical practical experience, ferrous, non-ferrous, sand and diecasting, also extruded. Seeks position as Technical Representative, or Sales Executive. Considerable administrative managerial experience. Excellent references. A.M.I.B.F. Reside any area. Box SE611, FOUNDRY TRADE JOURNAL.

YOUNG FOUNDRYMAN, used to controlling labour, experienced in pattern making, production and use of high-duty irons, cupola control, sand control and non-ferrous founding, seeks position as Foundry Manager or Assistant Manager. Box YF620, FOUNDRY TRADE JOURNAL.

PLANT ENGINEER (40), A.M.I.Plant.E., A.M.I.B.F., seeks new position. Comprehensive experience installation, development, maintenance mechanised foundries, machine shops, process plant, etc. Salary envisaged £1,500—£1,800 plus housing. Box PE592, FOUNDRY TRADE JOURNAL.

FOUNDRYMAN (40), M.I.B.F., nine years' managerial experience all aspects ferrous and non-ferrous production, mechanised, jobbing. At present employed Ceylon. Free August, 1960. Seeks position with reputable company. Anything considered. Could represent foundry plant, or allied concern such as refractories, etc. S.E. Asia or elsewhere. All replies to be addressed to Box FO618, FOUNDRY TRADE JOURNAL.

IRON FOUNDRY EXECUTIVE. C.I.Mech.E., aged 36, seeks senior position with progressive company where drive is appreciated. Fully experienced in modern methods of production and an ability to lead men. Box IF607, FOUNDRY TRADE JOURNAL.

SITUATIONS VACANT

MIDLANDS TECHNICAL REPRESENTATIVE, preferably based Birmingham area, for the sale of iron and steel foundry Refractories, chiefly foundry ceramics and holloware. Practical modern foundry experience essential. Under 25 years. Full relevant details to Box MT616, FOUNDRY TRADE JOURNAL.

ASSISTANT FOREMAN

Opportunity for ambitious young technically trained foundryman with ability to control labour. Good prospects in expanding company.

Reply giving details of experience, qualifications and salary required to:

CASTINGS LTD.
MALLEABLE IRON FOUNDERS
WALSALL

SITUATIONS VACANT—*contd.*

SALES REPRESENTATIVE required by Midland ironfounders for grey iron foundry division. Experience desirable but man with knowledge of foundry trade will be considered for training. Company car provided. Reply, stating age, qualifications and salary required, to Box SR627, FOUNDRY TRADE JOURNAL.

PATTERNMAKER required by medium mechanised foundry south east coast. Permanent position for man skilled in all phases, particularly metal and machine moulding plate patterns. Apply Box PR619, FOUNDRY TRADE JOURNAL.

FOUNDRY SUPERINTENDENT required for modern jobbing foundry situated in Gloucestershire producing medium size grey and high duty iron engineering castings up to 2 tons in green sand and CO_2. Excellent prospects for the right man but only first class foundryman capable of directing all operations on the shop floor should apply, stating age, experience, and salary required to Box FS609, FOUNDRY TRADE JOURNAL.

TECHNICAL SALESMEN

A LEADING Company with main interest in Iron Castings requires TWO REPRESENTATIVES to cover: 1. The North East, based preferably in Newcastle. 2. The North Midlands and South Yorkshire, based around Sheffield. Qualifications required are previous selling experience, knowledge of foundry work and, if possible, some engineering background. Preferred age 25-35. Salary offered is around £1,000 rising by bonus to £1,500, car and expenses provided, superannuation. Send full particulars plus indication of present salary to Box TS614, FOUNDRY TRADE JOURNAL.

METALLURGICAL CHEMIST required to take charge of laboratory employing people on Chemical and Metallurgical Analysis in connection with a large Iron Foundry situated in a pleasant area of the South Coast. Housing available. Please reply in writing, stating age, experience and salary required. Box ME629, FOUNDRY TRADE JOURNAL.

DERBYSHIRE EDUCATION COMMITTEE. CLOWNE TECHNICAL COLLEGE.

APPLICATIONS are invited for the full-time post of ASSISTANT LECTURER, GRADE A, qualified to teach Foundry Practice and Technology and allied subjects up to the standard of the final examination of the City & Guilds of London Institute. Ability to assist with Iron and Steel Operatives courses and to offer one or more of the subjects Mathematics, Machine Drawing, Elementary Engineering Science required.

The successful applicant will be required to commence duties within a few weeks, if possible, or at the latest, by 1st September, 1960.

Previous teaching or industrial experience will be taken into account for placing on the salary scale, viz. £520 × £27 10s. to £1,000, and additional increments will be allowed for degree or equivalent and training.

Further details and forms of application may be obtained from THE PRINCIPAL, Clowne Technical College, Rectory Road, Clowne, near Chesterfield, on receipt of a stamped-addressed envelope. Completed applications should be returned as soon as possible.

SITUATIONS VACANT—*contd.*

CASTER required, used to casting brass castings. High wages, and house provided at reasonable rent. Midland area. Box CR610, FOUNDRY TRADE JOURNAL.

FOUNDRY FOREMAN required (Midlands area). Experienced Blackheart Malleable. First class opportunities of advancement for man with drive and initiative. Pension Scheme. Full sports and social facilities. Staff appointment. Write, giving full details of age and experience, together with salary required to Box FF608, FOUNDRY TRADE JOURNAL.

FOREMAN MOULDER required for steel, iron and non-ferrous Foundry in Federation of Malaya. Must be conversant with all aspects of foundry practice. Applicants should preferably be single, under thirty. Attractive salary with quarters and heavy furniture at nominal rental. Local leave and home leave on full pay. Write Box Z.B. 342, DEACON'S ADVERTISING, 36, Leadenhall Street, London, E.C.3.

FIRST CLASS REPRESENTATIVE with good connections in Midlands and Southern England, for sale of aluminium castings. Excellent opportunities for right man with ability and enthusiasm. Good salary, expenses paid, and car provided. Applicants should state details of present salary, experience, and connections to Box 592, DORLAND ADVERTISING, LTD., 28, Haymarket, S.W.1.

FOUNDRY FOREMAN required for Stourbridge area. Must be fully experienced Moulder of Grey Iron Castings for jobbing and production. Able to train labour. Only fully experienced men with initiative need apply. The position could lead to Managerial status after proved ability, and offers scope for advancement. Apply Box FF630, FOUNDRY TRADE JOURNAL.

SENIOR FOUNDRY FOREMAN with experience of Blackheart malleable iron required for modern mechanised foundry. This is a position in which individual ability will be fully supported and recognised by a progressive management. Housing can be arranged in the new town of Cwmbran situated in the pleasant countryside of Monmouthshire. Please apply, giving full details of age, training, experience and present position to MR. A. D. MELLISH, Guest, Keen & Nettlefolds (Cwmbran), Ltd., Cwmbran, Mon. All replies will be treated with the strictest confidence.

DEVELOPMENT ENGINEER

METHODS - TIME STUDY - PLANT LAYOUT
CONTROL OF MAINTENANCE
DEPUTY TO MANAGING DIRECTOR

Real opportunity for ambitious young man.

Reply giving details of experience, qualifications and salary required to:—

CASTINGS LTD.
MALLEABLE IRON FOUNDERS
WALSALL

SITUATIONS VACANT—*contd.*

FOREMAN required for Modern Iron Foundry in North Manchester area. Must be fully experienced and highly skilled in all types of moulding and a good disciplinarian. A good salary will be paid to successful applicant. Applications, which will be treated in strict confidence. Must state age and full particulars of experience and should be addressed to Box FR602, FOUNDRY TRADE JOURNAL.

SENIOR DRAUGHTSMAN required with experience of Gravity and Pressure Dies or Moulds. Only competent men, able to command high salary, need apply. Works situated within 20 miles of North London. Apply Box SD580, FOUNDRY TRADE JOURNAL.

REQUIRED, ENGINEER with wide experience of modern mechanised foundries and preferably mains frequency induction melting/plant. Must be capable of co-ordinating proposals of various contractors engaged in layout and equipping of new foundry to produce large numbers of small semi-precision castings. This is a permanent position with a firm of good repute. Please reply stating age, experience in chronological order and salary required to Box RE604, FOUNDRY TRADE JOURNAL.

FOUNDRY FOREMAN required for non-ferrous Production Foundry, four Power Machines. Young practical man, able to take full charge immediately or after two years service. Full history, salary required. Box FF599, FOUNDRY TRADE JOURNAL.

METALLURGICAL CHEMIST experienced in ferrous and non-ferrous metals and raw materials for work in our expanding chemical laboratories. Good prospects for the accepted applicant. Shift working, staff appointment, superannuation scheme, staff dining room. Apply in confidence stating age and experience to PERSONNEL OFFICER, WEST YORKSHIRE FOUNDRIES LIMITED, Sayner Lane, Leeds 10.

SMALL IRON FOUNDRY in country district of North Staffordshire require a first-class Jobbing Iron Moulder preferably with Pump experience up to 2 tons. Works house—Modern—3 Bedrooms—available for right man. Age immaterial. Fullest details of experience in confidence. Write Box SM603, FOUNDRY TRADE JOURNAL.

SALES ENGINEERS: For various areas, competent men with experience of foundry drying stoves and ancillary equipment, heat treatment furnaces and sand plants. Must have established contacts. Knowledge of oven and furnace construction an asset. Required by very well known Midland manufacturers. Fullest support given to successful applicants. Write in first instance to: Box SE625, FOUNDRY TRADE JOURNAL.

WORKS ENGINEER with good knowledge of plant and electrical maintenance for up to date Leeds Works, including Mechanised Foundries. Salary around £1,000 p.a. depending on qualifications and experience. House can be made available. Give full career. Box WE626, FOUNDRY TRADE JOURNAL

ELECTRIC FURNACE SALES ENGINEER.

A HIGHLY qualified Sales Engineer who is well introduced in the foundry industry is required by Company holding the representation of leading manufacturers of electric furnaces, who are specialists in low frequency coreless and channel type induction furnaces, heat treatment and annealing furnaces of all types. Excellent salary and commission offered with ultimate Directorship. Reply giving full particulars to THE BIRMINGHAM MACHINERY CO., LTD., Daimler House, Paradise Street, Birmingham, 1.

SITUATIONS VACANT—*contd.*

APPLICATIONS are invited for the position of FOUNDRY MANAGER with foundry in West of England. Present output approximately 30 Tons per week from jobbing and mechanised section. Scope for extension of non-ferrous production. Applicant would be responsible for all technical processes, quality and labour administration. Sound knowledge of Metallurgy and Sand Control essential. Position offers scope for experienced person with enthusiasm and ability. Write in confidence, submitting details to Box FD590, FOUNDRY TRADE JOURNAL.

BELLISS & MORCOM LIMITED
Mechanical Engineers
wish to appoint a
FOUNDRY FOREMAN

who has experience in Grey Iron Casting using modern methods for production of medium sized castings. The position would appeal to a man who at present holds a junior supervisory position.

Interested and qualified persons are invited to submit written applications, in confidence, giving full personal details, including age, experience and present salary to:—

Personnel Manager,
BELLISS & MORCOM LIMITED,
Ledsam Street Works,
Birmingham, 16

MACHINERY WANTED

WANTED.—20 Ton E.O.T. Crane, approx. 44 ft. span, compressor 300 C.F.M. Box WA612, FOUNDRY TRADE JOURNAL.

WANTED

MOULDING M/cs: HPL1, and 2. Fitan 75-lb. Core Blower. Redford Bench Type Ditto. Fordath Core Sand Mixer, 5-10 cwt. Sand Mills: 3 ft. 6 in. to 6 ft. diam. Box MO628, FOUNDRY TRADE JOURNAL.

1½ G. "Reed Prentice" and "Edgwick" A.1611 Cold Chamber Die-casting Machines required for aluminium. Box MW586, FOUNDRY TRADE JOURNAL.

WANTED CHEAPLY by small Foundry, fairly modern 5 ft.—6 ft. Sand Mill, motorised 400/3/50. Also Tilghman Wheelabrator or Spencer & Halstead Shot Blast Plant. Must be cheap and real bargains. Box WC631, FOUNDRY TRADE JOURNAL.

4-5 CWT. capacity Core Sand Mixer. Must be in good condition. Box FC582, FOUNDRY TRADE JOURNAL.

URGENTLY WANTED

BMM Moulding Machines, type HPL, AT and RD. Large quantities of Steel Moulding Boxes. Box UW585, FOUNDRY TRADE JOURNAL.

MACHINERY FOR SALE

FOR SALE: Two 403/1 Jackman Osborne Rollover Moulding Machines. Box FS632, FOUNDRY TRADE JOURNAL.

MONOMETER SEMI-ROTARY FURNACE, two-ton capacity. Used on gunmetal. Two burners. Inspection: WHITLEY PARTNERS, LTD., Hunslet Road, Leeds, 10.

FOR SALE: One Dennison Crane Weighing Machine. Steelyard type. 5 tons × 2 lb. divisions. Apply: R. W. COLLIN, LTD., Pallion Foundry, Sunderland.

MACHINERY FOR SALE—*contd.*

MORGAN 15-CWT. TYPE C.A. TILTING FURNACE with Burner, Fan, Oil Pump and Heater, also 14 ft. high × 6 ft. diam. welded Fuel Tank, excellent condition.

S. C. BILSBY & CO.,
Haingo Road, Tividale, Tipton, Staffs.
'Phone: TIPton 2448.

1—A TYPE 600/1,200 oil fired Sklenar Furnace, Seliminite lining for copper melting. Purchased 1957.
2—Type S8486 Magnetic Moulding Machine with Mercury Arc Rectifier. Suitable for 400/440 v., 3 ph., 50 cycles electric supply. B.I.C. manufacture and purchased in 1942. This has not been in use for a number of years.
SERCK RADIATORS, LIMITED, Warwick Road, Birmingham, 11.

BRAYSHAW Gas Fired Bale Out Melting Furnace. Capacity 400 lbs. Working temperature 1,000 deg. C. Complete with all gas and air connections, control valves, etc., etc., and "Foster" temperature indicator and regulator. Condition second-hand, unused. WHITEFIELD MACHINERY & PLANT, LIMITED, 48, Chatham Street, Stockport, Cheshire. Telephone number: Stockport 4471.

ROCKING ARC FURNACE
for sale

BIRLEC 500lb., Indirect Arc Furnace complete with control Gear, and spare Furnace Shell.

SUITABLE FOR OPERATING ON A 6.5 or 11 kV. 50 Cycle Supply

Messrs. Fodens Limited,
Tel.: Sandbach 644
Elworth Works,
Sandbach, Cheshire

SPECIAL OFFER—
THE FOLLOWING PRACTICALLY NEW EQUIPMENT FOR SALE AT BARGAIN PRICES.

Six new and unused Drawer type Core Ovens, by Alldays & Onions.
Pneulec 2-cwt. capacity motorised Sand Mixing Machine.
Fordath, Rotoil No. 4 motorised Sand Mixing Machine.
MacNab jolt squeeze Moulding Machine.
Pneulec motorised Sand Disintegrator.
Alfred Herbert Sand Disintegrator.
Pneulec Royer Size No. 1.
Pneulec 2-ton capacity Balanced Blast Cupola.
Large stock of small Ladles.
200 Keith Blackman motor driven Blowing Fans in stock.
Large stock of Roper Ladles.
1,000 new Shanks, Tongs, etc., and small Ladles.
New Bale-out and Lift-out Furnaces. Leaflet and photograph available.
New Polford 600 lb. capacity Coke Fired Furnace.
Morgan 600 lb. capacity Coke Fired Tilting Furnace.

ELECTROGENERATORS LTD.
AUSTRALIA ROAD, SLOUGH, BUCKS.
Telephone. SLOUGH 22877 & 22094

MACHINERY FOR SALE—contd.

SKLENAR 050 Oil-fired Furnace. £200 o.n.o. SURREY PATTERNS & HOLMETHORPE FOUNDRY. Redhill 3787.

TWW

SAND WIZARD, 44 in. × 40 in. dia., complete with elevators, dust extraction plant, etc.
B.M.M. jolt squeeze Moulding Machine, H.P.L.1.
Two B.M.M. jolt squeeze turnover Moulding Machines, type RDO.
Jackman Shot Blast Cabinet, 32 in. × 24 in. × 33 in., with dust extractor, etc.
Braysha gas fired Muffle Furnace, cap. 40 in. × 30 in. × 18 in., with blower. Unbricked.
Sirocco 30 in. dia. Cupola Blower.
WIDE RANGE OF AIR COMPRESSORS ALWAYS IN STOCK.
Inspection: Thames Road, Silvertown, London, E.16.

THOS. W. WARD LTD.
BRETTENHAM HOUSE, STRAND, LONDON, W.C.2.
'Phone TEMple Bar 1515 (12 lines.)

Remember . Wards might have it!

SAND MILLS

PNEULEC 6-ft. dia. single roller muller and stirrer, Bucket Loader, and Disintegrator, enclosed motor drive: O.I. Starter.
Also 5 ft. dia. overdriven, 4 ft. and 5 ft. underdriven, etc.
S. C. BILSBY & CO., Haingo Road, Tividale, Staffs. 'Phone: Tipton 2448.

SHOTBLAST MACHINES
All sizes. Rooms or Cabinets. Ex stock or prompt delivery. Low prices.
Try us for
Spare parts & tungsten carbide nozzles.
Fully illustrated Catalogue free on Request.
Actual Manufacturers:
ELECTROGENERATORS LTD.
AUSTRALIA ROAD, SLOUGH
Telephone: SLOUGH 22877
35 years of satisfactory service

MACHINERY FOR SALE—contd.

FOR immediate disposal approximately 8 tons of Pig-iron. Analysis on request. No reasonable offer will be refused. Box FO615, FOUNDRY TRADE JOURNAL.

BRAYSHAW Gas Fired Vertical Hardening Furnace. Working temperature 650/1,000 deg. C. Work chamber 15 in. diameter × 24 in. deep. Complete with all gas connections, control valves, etc., etc., and "Foster" temperature control unit. Condition second-hand, unused. WHITEFIELD MACHINERY & PLANT, LIMITED, 48, Chatham Street, Stockport, Cheshire. Telephone number: Stockport 4471.

CAPACITY REQUIRED

ADVERTISERS require substantial regular supplies of Black Heart and White Heart Malleable Castings. Mainly jobbing work. Individual orders small to medium but total requirements substantial. Full details to Box AR587, FOUNDRY TRADE JOURNAL

CAPACITY AVAILABLE

VITREOUS ENAMELLING.—Capacity available for enamelling castings in all finishes (plain, mottle, marble, lustre etc.). Prompt delivery by our own transport.—THE EUSTLESS IRON CO., LTD., Trico Works, Keighley, Yorks. Tel.: Keighley 3737.

CASTINGS.—We can save your porous castings, ferrous or non-ferrous, by an approved impregnation Process; sample castings treated. A.I.D. approved.—RECUPERO, LTD., 66, South Harrow Viaduct Harrow, Middlesex. 'Phone: Byron 1178

Phone: Hockley (Essex) 337
HOCKLEY FOUNDRY CO. LTD.
HOCKLEY, ESSEX
for first class
CYLINDER-IRON CASTINGS BY SHELL & ALL MODERN PROCESSES
Quick & reliable delivery
London Address: 5 Osbert Street, Westminster, S.W.1.
Telephone: Victoria 7486

MATERIALS FOR SALE

CALCIUM SILICIDE. Finely ground Calcium Silicide—for nodular iron, exothermic compositions, etc. (now being successfully used by several foundries) at prices which save you money. TOXAM LIMITED, 47, High Street, Edgware, Middlesex. EDGware 6666.

pulverite
COAL DUST
lowest in ash
The STANDARD PULVERISED FUEL Co. Ltd
Head Office
47 VICTORIA STREET, WESTMINSTER LONDON, S.W.1 TEL: ABBey 6255/6

FIRE BRICKS
FROM LONDON STOCK
9 × 4½ × 3 in. 27 I.D. 139s. 6d. per 100
9 × 4½ × 3 in. 24 I.D. 139s. 6d. per 100
9 × 4½ Rectangular 115s. 6d. per 100
9 × 3 × 3 in. I.C. Pups 106s. per 100
PLEASE WRITE FOR DETAILS OF OTHER SIZES HELD IN STOCK IN LONDON
W. J. HOOKER LTD.
239A, FINCHLEY ROAD, LONDON, N.W.3

PATTERNMAKERS

PATTERNS for all branches of Engineering for Hand and Machine Moulding.—FURNISTON & LAWLOR, LTD. Letchworth.

FOR successful castings from your plant. Pressurecast matchplates, precision wood or metal pattern equipment can be purchased quickly, competitively, from BOOTH BROS. ENGINEERING, Baggrave Street, Leicester. Tel. 67020.

CORE OVENS
BOX OR AUTOMATIC
G. & R. GILBERT LTD.
Hackbridge Rd., Hackbridge, Surrey
Telephone: WALLINGTON 1073/4

H. BECK & SON LTD
STOCK THE LARGEST VARIETY OF FOUNDRY LADLES IN THE COUNTRY

CUPOLAS	WEST LANE	SAND HANDLING
FANS		JIB
LININGS		STATIC
CHARGING MACHINES		OVERHEAD CRANES
SPARK ARRESTERS		MONORAILS
CONVERTORS		MOULD BOXES
RECEIVERS		CHAINS
LADLE HOIST		SLINGS
POURING UNITS		BARROWS
		REQUISITES

KEIGHLEY 4132

PATTERNMAKERS' Section

WILLEY & CO. LTD
ENGINEERS, EXETER

Makers of First Class Wood & Metal Patterns, Pressure Cast Plates, etc.

Prompt deliveries at competitive prices.

Telephone Exeter 74064

THE
KERR PATTERN CO. LTD
ALL TYPES OF PATTERNS
ROSEMARY LANE, **LINCOLN**
TELEPHONE : LINCOLN 241

PATTERNMAKING
LARGE CAPACITY AVAILABLE
IN ALL BRANCHES OF THE TRADE
MARSDEN HIND & SON LTD.
GUIDE BRIDGE WORKS,
JOHN ST., ASHTON-U-LYNE
EST. 1929 TEL: ASH 2426

PATTERNS WOOD AND METAL
CAPACITY FOR WADKIN PATTERN MILLER
GOOD DELIVERIES
ELLIOTT MUSGRAVE, LTD.,
LONGSIDE LANE, BRADFORD, 7
Telephone : BRADFORD 24464

PATTERNMAKERS
(Engineering) CO. LTD.
Shrewsbury Road, London, N.W.10
PATTERNS
CASTINGS
Phone: ELGAR 8031/2

H. J. DOWLER (ENGINEERS' PATTERN MAKERS) LTD.

WOOD AND METAL PATTERNS. HYDRAULIC DUPLICATING.
PATTERNS FOR SHELL MOULDING. EPOXY RESIN PATTERNS.
GRAVITY DIES.

147 GRANVILLE STREET, BIRMINGHAM 1
MID 0649

STOKE-ON-TRENT 22627
COOKE BAILEY Ltd.
MORLEY ST., HANLEY STOKE-ON-TRENT
WOOD & METAL PATTERNS

B. LEVY & COMPANY (PATTERNS) LIMITED

MANUFACTURE BOTH WOODEN AND METAL PATTERN EQUIPMENT FROM THE SMALLEST AND MOST INTRICATE, UP TO THE VERY LARGEST AND HEAVIEST TYPES

First class workmanship by modern methods and plant enable us to offer reliable, prompt and competitive service

SEND YOUR ENQUIRIES, LARGE OR SMALL TO:
B. LEVY & CO. (PATTERNS) LTD., 1-5 OSBERT STREET, LONDON, S.W.1
TELEPHONE : VICTORIA 1073 or 7486

WM. CUMMING & CO., LTD.

Head Office : KELVINVALE MILLS, MARYHILL, GLASGOW, N.W.

Branches at : CHESTERFIELD, DEEPFIELDS AND FALKIRK.

BLACKINGS, PLUMBAGOS, COAL DUSTS, for all classes of work, and all other necessities for foundry practice.

FURNACES (Crucible), SAND MIXERS, ELECTRIC RIDDLES, and MOULDING MACHINES (Jolt and Hand Rammed).

EPOXY RESIN PATTERNS

SAVE *STORAGE! TIME! LABOUR! with–*

PICKARD'S

READY-MIXED MOULDING AND LAMINATING COMPOUNDS

W. PICKARD & CO. LTD. SAXON WORKS
Rutland Road, Sheffield 3.
Phone 21284/5

ALBERT SMITH & CO.

60, St. Enoch Square
Phone: Central 5909 **GLASGOW, C.1** 'Grams Thrower, Glasgow

FOR COMPLETE FOUNDRY PLANT SERVICE TOOLS FURNISHINGS

EVERYTHING FOR THE FOUNDRY

Metal treatment

and Drop Forging

A monthly journal devoted to the properties, uses, testing and treatment of special steels and light alloys, and to forging technique in all its branches, 2/6d. per copy, 30/- yearly.

Write for a specimen copy to :

Metal Treatment and Drop Forging
John Adam House, 17/19, John Adam St., London, W.C.2

COKE

FOR ALL PURPOSES

CAWOOD WHARTON & CO. LTD.

"SOUTHLANDS" HARROGATE.
TEL. Harrogate 6860

ST. MARTIN'S HOUSE, LONDON, S.E.18
TEL. Woolwich 5232

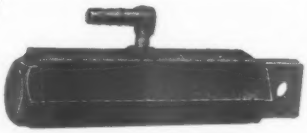
THE BRITISH SHOTBLAST & ENGINEERING CO. LTD.

STRETFORD LANCS. ENG.
PHONE : LONGFORD 1187

THE VERY LATEST IN SHOTBLAST EQUIPMENT & DUST ARRESTERS
NEW TYPE SHOTBLAST HELMETS IN MOULDED RUBBER, PRACTICALLY INDESTRUCTIBLE
PATENT APPLIED FOR.

WRITE NOW FOR PARTICULARS & PRICES

PNEUMATIC VIBRATOR



Available in two sizes :
1" bore 40/-
1½" „ 65/-

THE "EXPRESS" SQUEEZER

squeezing both parts simultaneously produces 200-300% faster than on the bench or stump.

PRICE **£80**

Complete with accessories

THE "EXPRESS" COREMAKER

★ Adjustable Air Control
★ Simple and Quick Height Adjustment
★ Extreme Accessability

This Machine, despite its low price, produces cores up to 9 lbs. as rapidly and efficiently as machines costing several times as much.

PRICE **£280**

FISHER FOUNDRIES LTD.

ALBION ROAD, GREET, BIRMINGHAM

Telephone : VICtoria 0197

Austins have been 'Metal People' for nearly 90 Years and still lead the field both at home and abroad. They have built up a reputation of being *the* people for non-ferrous metals, so why not approach them today if you require : Aluminium alloys, Copper alloys, Gunmetal, Aluminium Bronze, Manganese Bronze, Phosphor Bronze, Lead Bronze, Brass, Lead, Tin, Zinc, Solders, Typemetals.

AUSTINS NON-FERROUS METALS

E AUSTIN & SONS (LONDON) LTD

Hackney Wick, London E9
Tel : AMHerst 2211
Telex :
22550. Optative, London.

H

CONSULT THE EXPERTS
SAVE TIME AND MONEY

Photo by kind permission of Sterling Metals Ltd., Nuneaton.

SPECIALISTS IN THE FOLLOWING:—

Mechanical Handling Plants
Foundry Mechanisation
Factory & Foundry Automation
Plant Erection

FLOODGATE

FLOODGATE STEEL FABRICATING COMPANY LIMITED

758-786 KINGSBURY ROAD,
ERDINGTON, BIRMINGHAM 24
Tel.: ERDINGTON 6111/5

Z

CUT COSTS of foundry fettling with Zircosil

ZIRCON SAND AND FLOUR

ASSOCIATED LEAD
MANUFACTURERS LTD.

ZIRCOSIL

ZIRCON DIVISION, CRESCENT HOUSE,
NEWCASTLE UPON TYNE, 1.

Ovens Furnaces
Heating Elements

Laboratory Equipment
Technical Data

INDUSTRIAL ELECTRIC HEATING
NEW CATALOGUE AVAILABLE

HEDIN LIMITED

The new HEDIN Catalogue contains full details of many items in the Hedin range, **plus** a considerable amount of general technical data constantly needed for day-to-day calculations. It is an invaluable source of reference for anybody concerned with heat treatment or process heating.

To Hedin Limited,
Commerce Estate,
S.Woodford, London, E.18

Please send me a copy of your new Industrial Electric Heating Equipment Catalogue

Name .....

Position .....

Company .....

Address F.T.J.1

BLACKWELLS
FOR ALLOYS

FAMOUS SINCE 1869

★ *YOUR ENQUIRIES AND YOUR TECHNICAL QUERIES INVITED*

BLACKWELLS METALLURGICAL WORKS LTD.

Thermetal House, Garston, Liverpool, 19

Phone: GARston 980. *Grams:* Blackwell, Liverpool.

MANUFACTURERS OF ALLOYS OF:—

TITANIUM
COLUMBIUM
CHROMIUM
MANGANESE
MOLYBDENUM
SILICON
BORON

SUPPLIERS OF:—

RUTILE-ILMENITE
MAGNETITE
MANGANESE ORE
and all Minerals

Low Phosphorus

and

Sulphur contents

used for

High duty castings,

Cylinders,

Piston Rings,

Rolls, etc., and in

Open-Hearth and

Electric Steel Making

NORWEGIAN

ALL-MINE ELECTRIC

PIG IRON

CONTAINING VANADIUM & TITANIUM

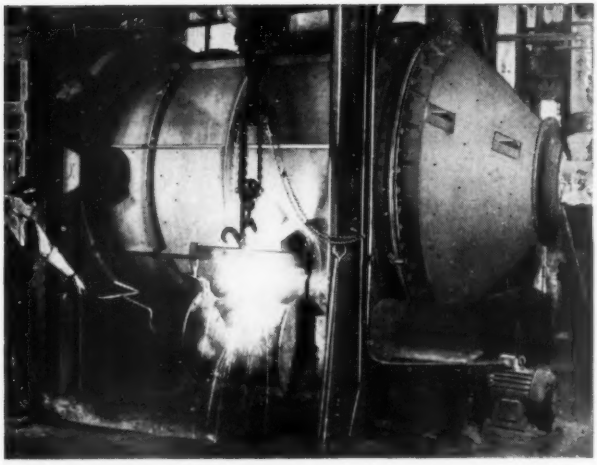
Bremanger Vanstil

APPLY TO:

DUNFORD & ELLIOTT (SHEFFIELD) LTD · Attercliffe Wharf Works, Sheffield, 9.
Telephone Nos. 41121 (5 lines). Telegrams: Blooms, Sheffield, 9

Over 6,000 tons of metal in 12 months from one lining of Webcoline

This Stein and Atkinson rotary furnace is in constant use for the production of Black and Whiteheart Malleable Iron.



The Superior Siliceous Monolithic Lining for Steel Converters, Rotary Furnaces, Cupolas, etc.

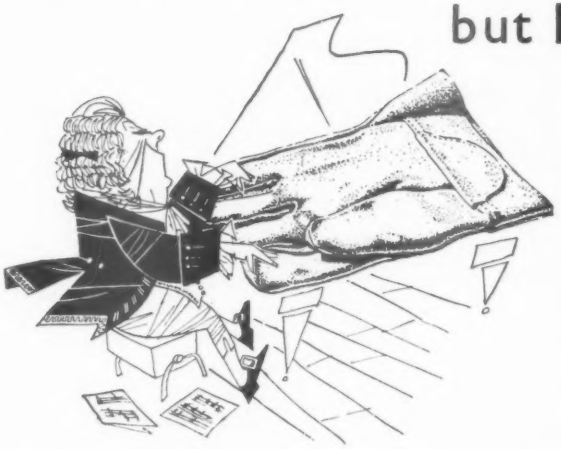
webcoline

OA/4086

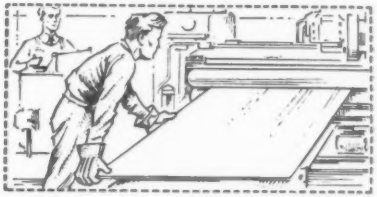
Manufactured by
PICKFORD HOLLAND AND COMPANY LIMITED,
Head Office: 381 Fulwood Rd., Sheffield 10. Tel: 33921

Handel didn't need **Bennett's** gloves—

but **handlers** do!



A wide range of quality Industrial Gloves, Mitts, Aprons and Clothing made from leather, rubber, asbestos, plastic and various fabric materials are made and stocked for all trades and processes. Technical Representatives are available for consultation in all parts of the British Isles at short notice.



BENNETT'S INDUSTRIAL GLOVES

H. G. BENNETT & CO. (Gloves) LTD. · Industrial Glove Specialists · LIVERPOOL 23 · Tel. GREat Crosby 3996/7

CVS-15

BUCKLAND RESIN-COAT SAND

FOR SHELL MOULDS AND CORES.

SANDS FOR CO_2 PROCESS AND OIL CORES

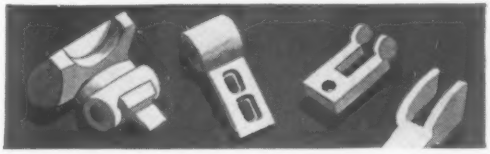
YOU CAN BE ASSURED OF A GOOD FINISH BY ALWAYS USING BUCKLAND SANDS

The Finest Obtainable

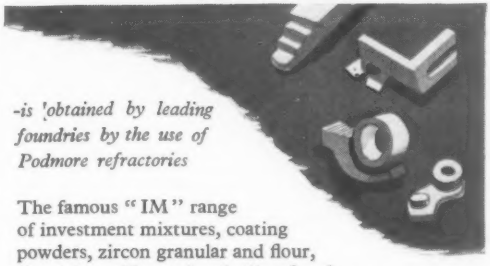
BUCKLAND SAND & SILICA Co. Ltd.

REIGATE HEATH · REIGATE SURREY TELEPHONE: REIGATE 2272

ESTABLISHED OVER 30 YEARS



Precision with economy



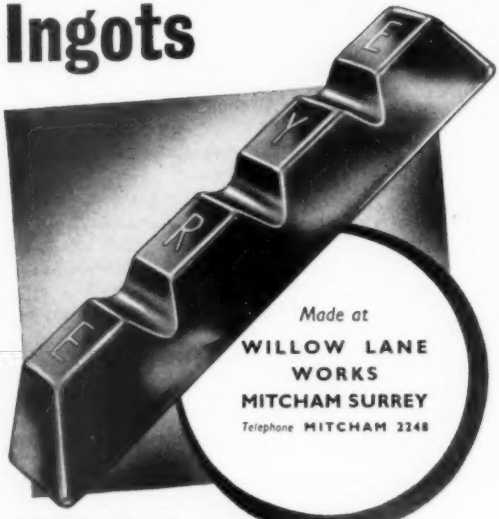
-is obtained by leading foundries by the use of Podmore refractories

The famous "IM" range of investment mixtures, coating powders, zircon granular and flour, aluminium silicate, fused silica, fused alumina, cristobalite, graded minerals and refractories of all types.

W. PODMORE & SONS LTD

CALEDONIAN MILLS · SHELTON · STOKE-ON-TRENT Tel 21241-3

EYRE
Aluminium Alloy Ingots



Made at
WILLOW LANE WORKS
MITCHAM SURREY
Telephone MITCHAM 2248

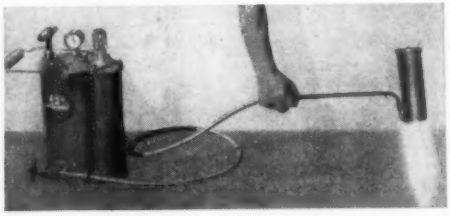
ESCO Gunmetal and Phosphor Bronze Ingots

Made at
TANDEM WORKS
MERTON ABBEY
LONDON S.W.19
Telephone MITCHAM 2031

THE
EYRE SMELTING CO. LTD.
TANDEM WHITE METALS . TANDEM BEARINGS
ARIEL & ESCO CHILLCAST PHOSPHOR BRONZE RODS

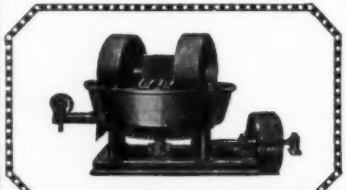
The "GEM"
FOUNDRY MOULD DRYING LAMP AND CUPOLA LIGHTER

BURNING PARAFFIN
ALSO COMPRESSED AIR OIL
SPRAY BURNERS



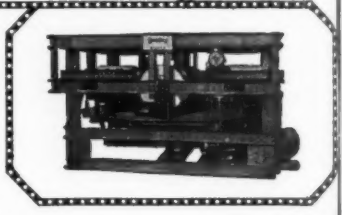
WOODWARD BROS. & COPELIN, LTD
Crunden Road, South Croydon, Surrey
Tel. CROydon 8078

TRADE Smedley MARK
SAND TREATING MILLS



BATCH MILL
1 to 20 cwts. per charge
CONTINUOUS MILL
5 to 40 tons per hour

Revolving or Stationary PANS
Over or under-driven



Smedley Brothers, Ltd.
Belper.
Derbyshire.

Telephone:
Belper 12

Oil-Fired **CRUCIBLE FURNACE**

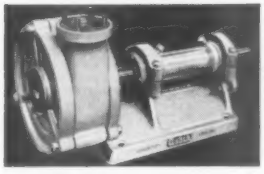
200lb. Copper Melting Capacity

Please send for details to:

NORRIS EQUIPMENT & CONSTRUCTION LIMITED

58 QUEENS ROAD · BRISTOL 8

TELEPHONE BRISTOL 36817



from ¾"

to 12"

LOOK TO

LINATEX

P54

. . . for the most reliable pumps in the world for handling Abrasive Solids in suspension, Chemicals and Effluents. In all sizes from ¾ in. to 12 in. There is a Linatex Engineer in your area available for consultation and advice, phone or write :

WILKINSON RUBBER LINATEX LTD · CAMBERLEY · SURREY · Tel: CAMBERLEY 1595

BLACK SEAM AND HISEGAR REFRACTORIES

Linings, Patchings, Cements, Ground Fireclay, Firebricks, Foundry Sands and Compo.

BLACK SEAM

preheated downdraught

CRUCIBLE FURNACES

Coke, Oil or Gas Fired

Free demonstrations at your works

MIDLAND MONOLITHIC FURNACE LINING COMPANY LIMITED

GOOSE LANE, BARWELL, LEICESTER

Tel. Earl Shilton 2061/2 (2 lines)

FOR GRAVITY DIES

R. E. Ormerod Ltd

EDNALL LANE, BROMSGROVE, Worcs.

Telephones 2987 & 3576

INDEX TO ADVERTISERS

	PAGE Nos.
Ace Heaters (Hy-Lo), Ltd.	—
Air Control Installations Ld.	2
Albion Diemakers, Ltd.	—
Alcan (U.K.), Ltd.	—
Allan, John, & Co. (Glenpark), Ltd.	—
Allen, W. G., & Sons (Tipton), Ltd.	—
Alley & MacLellan (Polmadie), Ltd.	—
Amber Oils, Ltd.	—
Anderson-Grice Co., Ltd.	—
Annealers, Ltd.	—
Armstrong Whitworth (M.I.), Ltd.	—
Armstrong Whitworth & Co. (Pneu. Tools), Ltd.	24
Ashworth Ross Co., Ltd.	—
Aske, Wm., & Co., Ltd.	—
Associated Electrical Industires, Ltd. (Motor & Control Gear Division)	—
Ass. Lead Mfrs., Ltd.	48
Association of Light Alloy Refiners, Ltd.	—
Atlas Copco (G.B.) Ltd.	—
August's, Ltd.	40
Austin, E., & Sons, Ltd.	47
Badische Maschinenfabrik A.-G.	—
Bairds & Scottish Steel, Ltd.	—
Baker Perkins, Ltd.	607
Ballard, F. J., & Co., Ltd.	—
Ballinger, L. J. H., Ltd.	—
Beck, H., & Son, Ltd.	44
Belliss & Morcom, Ltd.	—
Bennett, H. G., & Co. (Gloves) Ltd.	51
Berk, F. W., & Co., Ltd.	—
Bilston Shot & Grit Co., Ltd.	—
Bilston Stove & Steel Truck Co., Ltd.	—
Birkett, F. W., & Co., Ltd.	—
Birlec-Efco (Melting), Ltd.	56
Birlec, Ltd.	—
B.I.X., Ltd.	—
Black & Decker, Ltd.	—
Blackwell's Metallurgical Works, Ltd.	49
Block & Anderson, Ltd.	—
Bloomer-Holt, Ltd.	—
Boydell, E., & Co., Ltd.	—
Bradbury, John, & Co. (Stockport), Ltd.	—
Bradley & Foster, Ltd.	6
British Acheson Electrodes, Ltd.	—
British Aero Components Ld.	34
British Electrical Repairs, Ltd.	—
British Foundry Units, Ltd.	—
British Industrial Sand Ltd.	29
British Iron & Steel Federation	—
British MonoRail, Ltd.	—
British Moulding Machine Co., Ltd.	—
British Oxygen Co., Ltd.	—
British Ronceray, Ltd.	—
British Shotblast & Engineering Co., Ltd.	46
Broadwell Engineering, Ltd.	—
Broom & Wade, Ltd.	21
Buckland Sand & Silica Co., Ltd.	51
Burn, John, & Co. (B'ham), Ltd.	—
Busby Bros., Ltd.	—
Carborundum Co., Ltd.	—
Catalin, Ltd.	—
Cawood Wharton & Co., Ltd.	46
Chetham Timber Co., Ltd.	—
Ciba (A.R.L.), Ltd.	—
City Casting & Metal Co., Ltd.	—
Clayton Crane & Hoist Co. Ltd.	—
Cohen, Geo., Sons & Co., Ltd.	—
Coleman-Wallwork Co., Ltd.	37
Combustion Chemicals, Ltd.	—
Consolidated Pneumatic Tool Co., Ltd.	—
Constructional Engineering Co., Ltd., The	—
Controlled Heat & Air, Ltd.	—
Cooke, Bailey, Ltd.	45
Cox & Danks, Ltd.	—
Crockett Lowe, Ltd.	22
Cumming, Wm., & Co., Ltd.	46
Cupodel, Ltd.	—
Dallow Lambert & Co., Ltd.	—
Derby & Co., Ltd.	—
Distillers Co., Ltd., The	—
Distington Engineering Co., Ltd.	—
Dowler, H. J., Engineers & Pattern Makers, Ltd.	45
Dowson & Mason, Ltd.	28
Dunford & Elliott, Ltd.	50
Durrans, James, & Sons, Ltd.	55
Dustraction, Ltd.	—
Dustuctor Co., Ltd.	—
Electrical Development Assoc.	—
Elliott, E., & Co., Ltd.	—
Engineering Services (Manchester), Ltd.	—
Escol Products, Ltd.	—
Evans, James, & Co., Ltd.	—
Evans, Stanley N., Ltd.	33
Evershed & Vignoles, Ltd.	—
Eyre Smelting Co., Ltd.	52
F. & M. Supplies, Ltd.	605
Feico Hoists, Ltd.	—
Fellows & Darby, Ltd.	—
Fischer, George, Ltd.	—
Fisher-Foundries, Ltd.	47
Fletcher Miller, Ltd.	—
Flextol Engineering Co., Ltd.	—
Floodgate Steel Fabricating Co., Ltd.	48
Fordath Engineering Co., Ltd.	35
Foundry Equipment, Ltd.	12 & 13
Foundry Mechanisations (Bailiol), Ltd.	—
Foundry & Metallurgical Equipment Co., Ltd.	27
Foundry Plant & Machinery, Ltd.	—
Foundry Services, Ltd.	—
Foundry Suppliers, Ltd.	—
Foxboro-Yoxall, Ltd.	26
Franklin Furnaces, Ltd.	—
Fuel & Metallurgical Processes, Ltd.	—
Fullers' Earth Union, Ltd., The	14
G.W.B. Furnaces, Ltd.	—
Gadd, Thos.	—
Gas Council	—
General Refractories, Ltd.	—
Gilbert, G. & R., Ltd.	44
Gliksten, J., & Son, Ltd.	—
Goodyear Tyre & Rubber Co., Ltd.	—
Green, E., & Son, Ltd.	—
Green, Geo., & Co.	—
Gregory, J. G., & Sons, Ltd.	—
Griffiths, A. E. (Smethwick), Ltd.	—
Guest, Keen Iron & Steel Co., Ltd.	—
Hanover Fair	—
Harborough Construction Co., Ltd.	3
Hargraves Bros. (Manchester), Ltd.	—
Harris & Pearson, Ltd.	—
Harvey & Longstaffe, Ltd.	—
Harvey, J. J. & Pressureeast, Ltd.	49
Hedin, Ltd.	—
Heneage Metals, Ltd.	—
Hepburn Conveyor Co., Ltd.	17
Heywood, S. H., & Co., Ltd.	—
High Speed Steel Alloys, Ltd.	—
Hills (West Bromwich), Ltd.	19
Holmes, W. C., & Co., Ltd.	10
Hooker, W. J., Ltd.	—
Hunt, F. L., Ltd.	—
I.C.I. (Billingham Division), Ltd.	—
I.C.I. (Plastics Division), Ltd.	—
Ilford, Ltd.	36
Impregnated Diamond Products, Ltd.	—
Incandescent Heat Co., Ltd.	—
Ingersoll-Rand Co., Ltd.	—
Jackman, J. W., & Co., Ltd.	—
Jacks, Wm., & Co., Ltd.	41
Joy-Sullivan, Ltd.	—
Keith-Blackman, Ltd.	—
King, Geo. W., Ltd.	—
Lafarge Aluminous Cement Co., Ltd.	—
Laidlaw, Drew & Co., Ltd.	—
Lazarus, Leopold, Ltd.	—
Leicester Lovell & Co., Ltd.	—
Levy, B., & Co. (Patterns), Ltd.	45
L.M.S. Products, Ltd.	—
Lones, Joseph Laboratories	—
Lord, E. S., Ltd.	—
Luke & Spencer, Ltd.	—
Macnab & Co., Ltd.	30
Major, Robinson & Co., Ltd.	—
Mansfield Standard Sand Co., Ltd.	—
Marco Conveyor & Engineering Co., Ltd.	—
Matthews & Yates, Ltd.	—
May, J. H., Ltd.	—
McKechnie Bros., Ltd.	—
Metalectric Furnaces, Ltd.	—
Metalline Cement Co., The	—
Metals & Equipment (Wolverhampton), Ltd.	—
Midgley & Son, Ltd.	—
Midland Monolithic Furnace Lining Co., Ltd.	53
Mine Safety Appliances, Ltd.	—
Mirrlees Watson Co., Ltd.	—
Modern Furnaces & Stoves, Ltd.	16
Molineux Foundry Equipment, Ltd.	25
Monometer Manufacturing Co., Ltd.	—
Mond Nickel Co., Ltd.	—
Morgan Crucible Co., Ltd.	—
Morris, B. O., Ltd.	—
Morris, H., Ltd.	—
Muir, Murray & Co., Ltd.	—
Newman Industries, Ltd.	—
Newton Collins, Ltd.	—
Newman Hender & Co., Ltd.	—
Nicholl & Wood, Ltd.	—
Norris Equipment & Construction, Ltd.	53
Ormerod, R. E., Ltd.	53
Palmer Aero Products, Ltd.	—
Parish, J., & Co., Ltd.	—
Park & Paterson, Ltd.	—
Parkinson Cowan Industrial Products	—
Passe, J. F., & Co.	—
Paterson Hughes Engineering Co., Ltd.	—
Patterncrafts, Ltd.	—
Pearson, E. J. & J., Ltd.	—
Peco Machinery Sales, Ltd.	31
Perry, G., & Sons, Ltd.	—
Phillips, J. W. & C. J., Ltd.	—
Pickard, W., & Co., Ltd.	46
Pickford, Holland, Ltd.	50
Platt Metals, Ltd.	—
Pneulec, Ltd.	7
Podmore, W., & Sons, Ltd.	51
Polford Engineering Co., Ltd.	—
Polygram Castings Co., Ltd.	15
Pontifex, H., & Sons, Ltd.	—
Prat-Daniels (Stroud), Ltd.	—
Precision Presswork Co., Ltd.	—
Price, J. T., & Co., Ltd.	—
Production Chemicals (Rochdale), Ltd.	—
Purimachos, Ltd.	—
Reavell & Co., Ltd.	—
Refined Iron Co. (Darwen), Ltd.	—
Reid, Wm., & Co.	—
Resinous Chemicals, Ltd.	—
Richards Structural Steel Co., Ltd.	—
Richardson Eng'g., Ltd.	—
Richardsons, R. J. & Sons Ltd.	—
Riddale & Co., Ltd.	—
Riley (I.C.) Products, Ltd.	—
Robson Refractories, Ltd.	—
Roper, E. A., & Co., Ltd.	8
Rowland, F. E., & Co., Ltd.	32
Rownson (Conveyors), Ltd.	—
Rubery Owen & Co., Ltd.	—
Rule & Moffat	—
Rustless Iron Co., Ltd.	—
Safety Products, Ltd.	—
Salter, Geo. & Co., Ltd.	—
St. George's Engineers, Ltd.	—
Sheffield Smelting Co., Ltd.	—
Shell Chemical Co., Ltd.	38
Sheppard & Sons, Ltd.	—
Sinex Eng'g. Co., Ltd.	—
Sklenar Furnaces, Ltd.	5
Smedley Bros., Ltd.	52
Smeeton, J. A., Ltd.	—
Smith, A., & Co.	46
Smith, John (Keighley) Ltd.	—
Sommerfield, H. G., Ltd.	—
Spencer & Halstead, Ltd.	23
Spermolin, Ltd.	—
Stansby, W., & Co., Ltd.	—
Stanton Ironworks Co., Ltd. The	—
Staveley Iron & Chemical Co., Ltd.	—
Steels Engineering Installations	—
Stein, John G., & Co., Ltd.	—
Sterling Foundry Specialties, Ltd.	11
Sternol, Ltd.	—
Stott, S. S., Ltd.	4
Suffolk Iron Foundry (1920), Ltd.	—
Swynnerton Red Moulding Sand	—
Tallis, E., & Sons, Ltd.	18
Tangyes, Ltd.	—
Taylor Patterns, Ltd.	—
Temple Instruments, Ltd.	—
Thomas, G. & R., Ltd.	—
Thompson, John, Instrument Co., Ltd.	—
Thorp, J. & Son Ltd.	—
Tilghman's, Ltd.	20
Union Carbide, Ltd.	—
Unit Engineering Co.	—
United Fireclay Products, Ltd.	9
United States Metallic Packing Co., Ltd.	—
Universal Pattern & Precision Engineering Co., Ltd.	—
Verrolec, Ltd.	—
Victor Products, Ltd.	—
Wadkin, Ltd.	—
Wal-Met. Alloys Co.	—
Walker, I. & I., Ltd.	—
Ward, Thos. W., Ltd.	1
Waring Bros.	—
Warner & Co., Ltd.	—
Warrington Red Sand	—
Watsons (Metallurgists) Ltd.	—
Webster & Co. (Sheffield) Ltd.	—
West Midland Refining Co., Ltd.	—
Wigley Aluminium, Ltd.	—
Wilkinson Rubber-Linatex Co., Ltd.	53
Willan, G. L., Ltd.	—
Wilson, T. S., & Co. (Graphite) Ltd.	—
Witham, L. A., & Co.	—
Woking Pattern Works, Ltd.	—
Woodward Bros. & Copelin, Ltd.	52
Wright & Platt, Ltd.	—

Published by the Proprietors, INDUSTRIAL NEWSPAPERS, LIMITED, John Adam House, 17/19, John Adam Street, London, W.C.2, and Printed in Great Britain, by HARRISON & SONS, LIMITED, by Appointment to Her Majesty The Queen Printers, London, Hayes (Middx) and High Wycombe.

NO. 10 PREPARED BLACKING

PHŒNIX

BLACKING or PLUMBAGO MIXTURE for the CO_2 process

STEELMOL *for STEEL and SPECIAL IRON CASTINGS*

HIGH CARBON BLACKING · CEYLON PLUMBAGO
TERRA FLAKE · COAL DUST · GANISTER AND
"ALUMISH" FOR ALUMINIUM
Non-Silica PARTING POWDER

JAMES DURRANS & SONS LTD

PHŒNIX WORKS & PLUMPTON MILLS PENISTONE near SHEFFIELD
Telephone : PENISTONE 3121 and 3122 *Telegrams* : BLACKING, PENISTONE

FOUNDRY TRADE JOURNAL

EST. 1902

WITH WHICH IS INCORPORATED THE IRON AND STEEL TRADES JOURNAL

VOL. 108
No. 2266

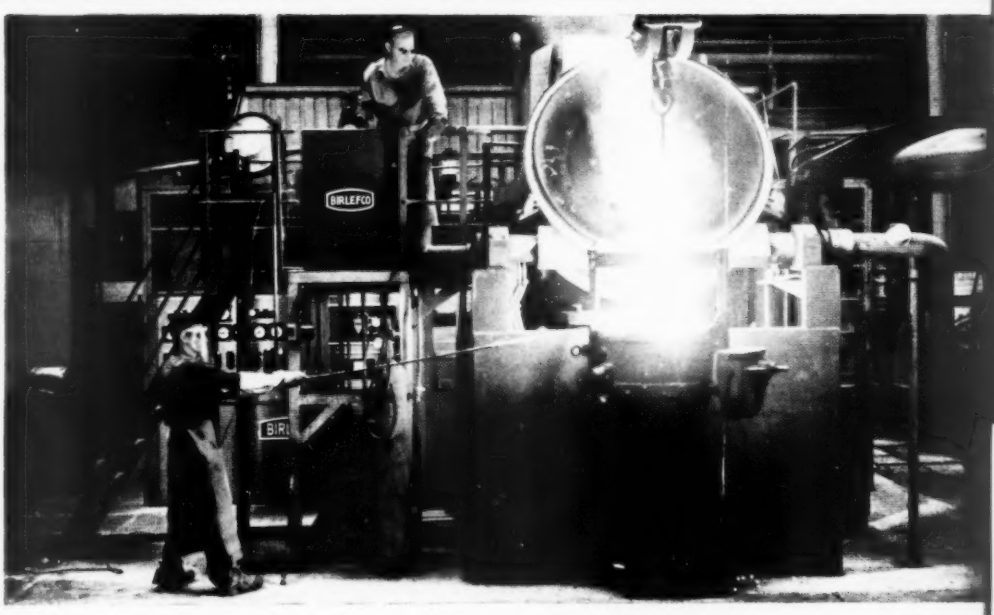
MAY 12, 1960

Registered at the G.P.O. as a Newspaper

Offices: John Adam House, John Adam St., London, W.C.2

Single Copy, 1.
Post 1 4. Annua
scription. Home
Abroad 60 - (Pre

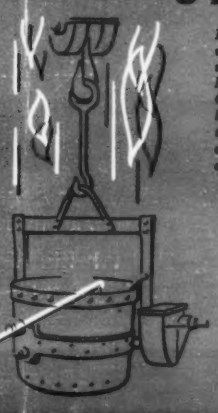
VACUUM REFINING of MOLTEN MET



Birlefco advance in vacuum technology

At a considerably reduced capital and operating cost, compared with conventional vacuum melting, the new Birlefco de-gassing and refining furnace ensures metal of high purity and uniform properties. Molten metal from an auxiliary source is charged into the furnace, which is a mains frequency induction unit housed in a tiltable vacuum tank. Chamber pressure is then reduced to about 250 microns and less within a quarter of an hour. After vacuum treatment air is re-admitted into the furnace chamber and the metal is poured into a ladle for casting or teeming in the conventional manner.

In this way practically all the benefits of induction vacuum melting can be obtained on a continuous production basis at a cost of only a few pence per lb. of metal treated.



15 cwt. vacuum unit inst... Henry W... Co. Ltd., ... ham. Ra... the furna... engaged ... alloy pro...

BIRLEFCO

BIRLEC-EFCO (MELTING) LIMITED

Westgate · ALDRIDGE · Staffordshire

Telephone: Aldridge 52071

Copy. 1
4. Annu
on. Home
1 60 - (Pr

E T